# STATE OF SOUTH CAROLINA

# HAZARDS ASSESSMENT

# 2005

## South Carolina Emergency Management Division
## Office of the Adjutant General

**Update Prepared By the**
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# 1 INTRODUCTION

The complex topography of South Carolina ranges from mountainous regions to coastal plains necessitating investigation of several different types of natural hazards associated with these regions. South Carolina also has a diverse industry base ranging from light manufacturing facilities to nuclear power plants, which pose varying levels of technological hazards. The State's complex topography coupled with this industrial base and population distribution requires extensive investigation to determine potential exposure and risk to people and property from hazards and to initiate mitigation strategies that reduce the threat associated with these hazards.

Both natural (e.g. hurricanes, tornadoes, lightning) and technological hazards (e.g. hazardous material spills, dam failures, structural fires) threaten the entire state. Some hazards like tornadoes have a quick onset that offers little opportunity for warning, while others are chronic and difficult to mitigate such as drought and chemical releases. Most of these hazards, however, have the potential to disrupt day-to-day activities, cause extensive property damage, and create mass casualties.

# 2 PURPOSE AND SCOPE

## 2.1 Planning

This assessment is presented in phases to simplify the work process leading to the final overview of the state. Each phase is further broken down into stages. Completing the group of stages within a phase leads to the completion of that phase. Completion of all phases results in the overall assessment (Figure 2.1). For ease of understanding and readability, the results of the statewide assessment are presented first, followed by the phases that lead up to those final results. It is important to note that hazards assessments are dynamic and require annual review, update, and approval.

As there continues to be no FEMA prescribed national methodology, South Carolina uses the University of South Carolina's Hazards Research Laboratory Handbook for Conducting a GIS-Based Hazards Assessment at the County Level. This methodology can be used by counties (or their designates) as they develop their All-Hazard Assessment. The procedure does not result in a Risk Assessment, per se, but does provide the information needed to perform one.

The Statewide Hazards Assessment will be reviewed and revised annually as new and more recent data become available. For example, the 2000 Census data offer a better representation of the demographics in South Carolina, and the incorporation of recent (post 1996) hazard event data will improve the Hazard Frequency of Occurrence data. Also, other hazards will be added as data become available. Point locations of hail events and better measures of extreme heat and drought events are a few examples of the hazards we expect to add in future annual updates. We also anticipate adding loss data. These data would enable a closer examination and ranking of hazards in order of their

impact. At present, however, there are no data for property loss (damage), injury, and death for all hazards categories.

## 2.2 The All-Hazard Assessment Procedure

The All-Hazard Assessment Procedure is a version of the flow chart from the Handbook and is provided in Figure 2.1.

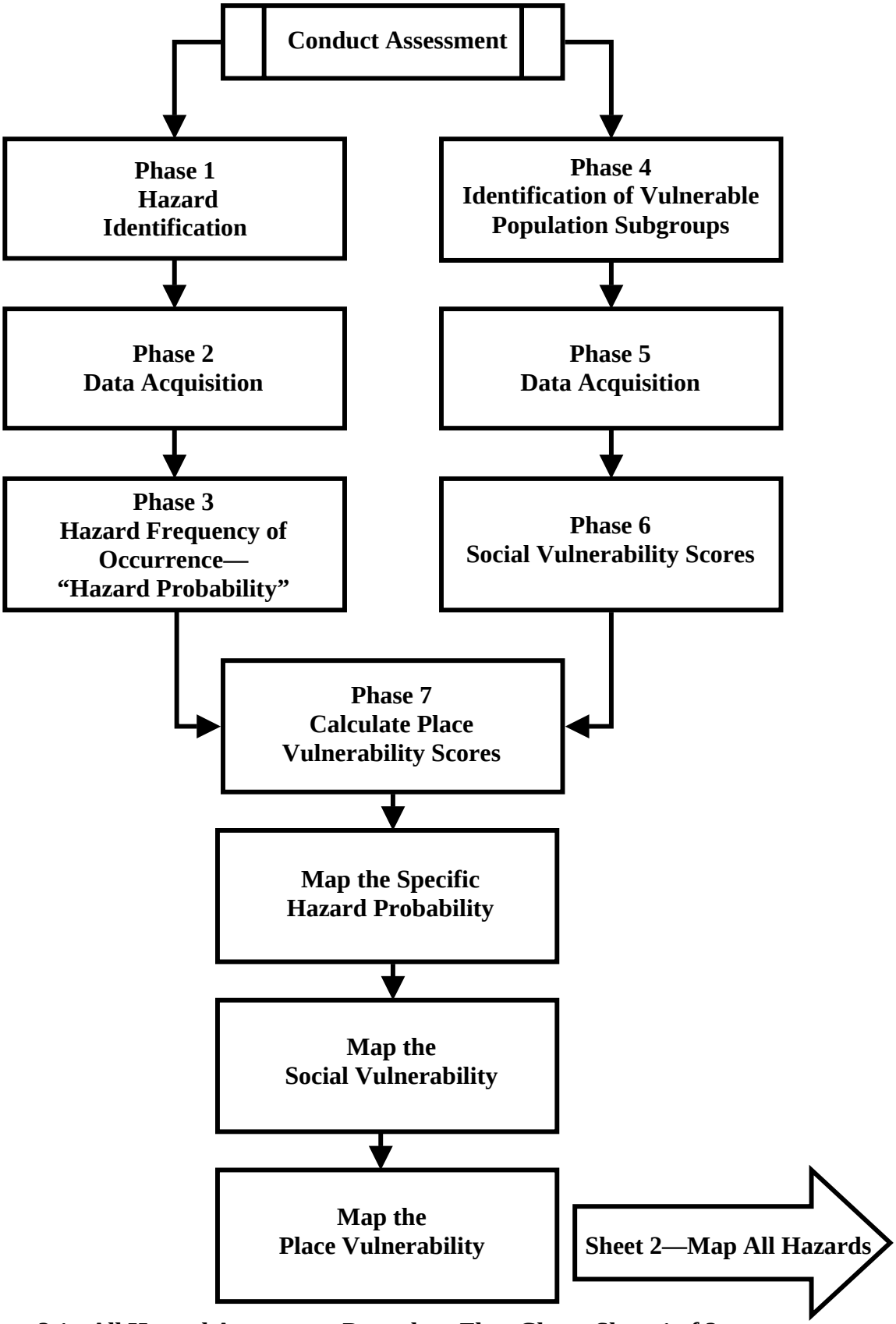


**Figure 2.1: All Hazard Assessment Procedure Flow Chart, Sheet 1 of 2**

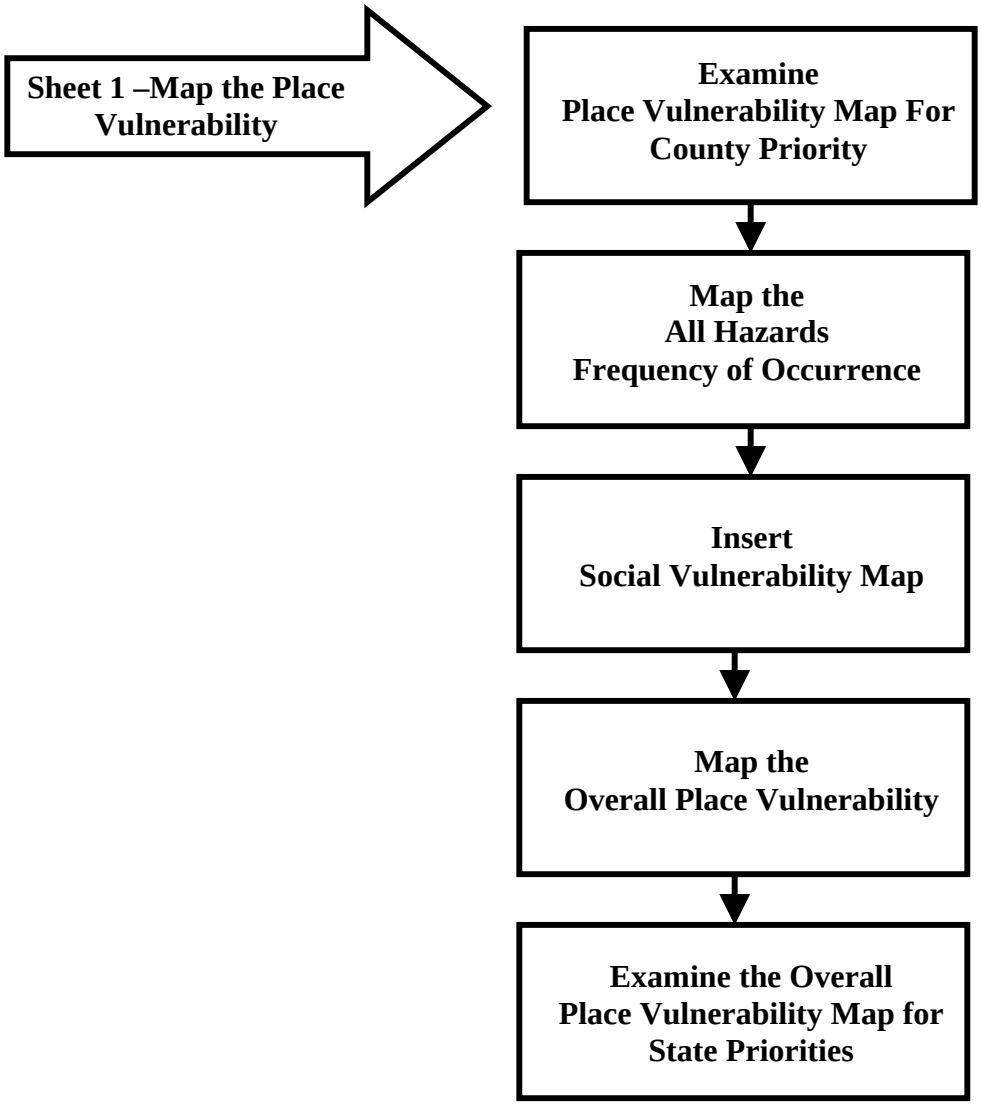


**Figure 2.1: Continued: All Hazard Assessment Procedure Flow Chart, Sheet 2 of 2**

# 3 PLACE VULNERABILITY RESULTS

## 3.1 Total Place Vulnerability

Total Place Vulnerability is simply an index that ranks counties by level of exposure or potential threat from all hazards. This index is derived from the integration of the Total Hazard Frequency of Occurrence Scores (p. 10-13) and the Social Vulnerability Scores (p. 14-15).

## 3.2 Total Hazard Probability of Occurrence

The upper choropleth map in Figure 3.1 represents the All Hazard Probability for South Carolina. This map was created from frequency of occurrence scores derived from all hazards. Notice the number of counties in the High range. These counties, located mainly in the coastal plain, have the highest all hazard probability. They are: Berkeley Charleston, Horry, Lexington, Florence, Orangeburg, Williamsburg, Clarendon, and Colleton Counties. These counties have the highest potential threat from all hazards occurring in the state based on more than twenty-five years of historical data. Total hazard probabilities can be seen in Table 3.1.

## 3.3 Total Social Vulnerability

The middle choropleth map in Figure 3.1 represents the relative Social Vulnerability of each county. Social vulnerability scores were derived from variables including age, gender, population, race, income, and number of mobile homes per county (Cutter et al. 2000). The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. County rankings by total social vulnerability scores are found in Table 3.1.

## 3.4 Total Place Vulnerability Scores

The bottom choropleth map in Figure 3.1 represents the Total Place Vulnerability scores for all hazard categories. This map is the result of the integration of the All Hazard Probability data layer and the Social Vulnerability data layer.

When the sum of the Hazards Probability scores are multiplied by the overall Social Vulnerability scores for each county, nine of them (Aiken, Berkeley, Charleston, Florence, Horry, Lexington, Orangeburg, Richland, and Williamsburg) fall into the highest category of Total Place Vulnerability. These counties have significant populations exposed to multiple hazards. While all counties should have mitigation plans as well as effective response and recovery plans, these nine counties show the greatest need for strong mitigation and response plans. In addition, several other counties (scattered throughout the coastal plain and the upstate) fall in the medium-high range. These counties also have relatively high social vulnerabilities and equally need strong mitigation and response plans.

All scores ranked by Place Vulnerability are shown in Table 3.1, which includes both the probability of occurrence score and the social vulnerability score. Using the Total Place Vulnerability Scores to rank counties doesn't help to totally understand what is contributing to its hazard vulnerability. Table 3.2 shows the breakdown by individual hazard category. Place Vulnerability scores were divided by 100 since some of the individual scores in the individual hazard categories resulted in very large numbers.

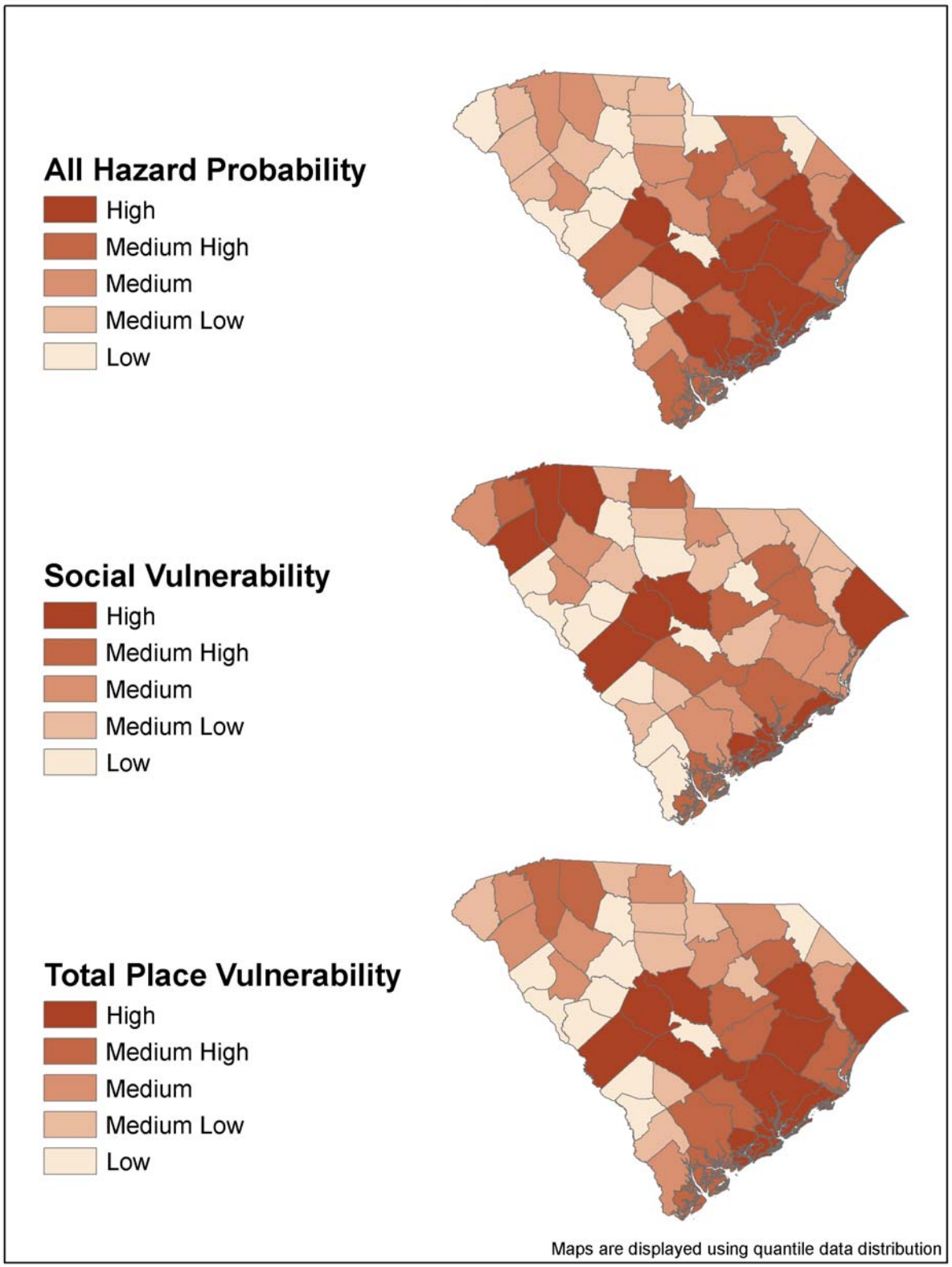


**Figure 3.1: Total Hazard Probability of Occurrence, Social Vulnerability, and Total Place Vulnerability Scores**

## Table 3.1: Counties Ranked by Place Vulnerability Scores*

| Rank | County | Probability of Occurrence* | Social Vulnerability Score | Place Vulnerability Score* |
|---|---|---|---|---|
| 1 | CHARLESTON | 23790.60 | 5.59 | 1329.89 |
| 2 | BERKELEY | 34715.27 | 2.93 | 1017.16 |
| 3 | LEXINGTON | 25107.12 | 3.86 | 969.13 |
| 4 | HORRY | 20781.34 | 4.52 | 939.32 |
| 5 | ORANGEBURG | 25744.90 | 2.81 | 723.43 |
| 6 | FLORENCE | 22158.68 | 2.94 | 651.47 |
| 7 | WILLIAMSBURG | 34066.79 | 1.80 | 613.20 |
| 8 | RICHLAND | 10344.88 | 5.52 | 571.04 |
| 9 | AIKEN | 18288.61 | 3.10 | 566.95 |
| 10 | GREENVILLE | 8240.90 | 6.37 | 524.95 |
| 11 | SUMTER | 14740.24 | 2.71 | 399.46 |
| 12 | SPARTANBURG | 8321.46 | 4.80 | 399.43 |
| 13 | COLLETON | 23730.44 | 1.64 | 389.18 |
| 14 | CLARENDON | 18979.81 | 1.56 | 296.09 |
| 15 | DARLINGTON | 12929.08 | 2.06 | 266.34 |
| 16 | DORCHESTER | 14599.49 | 1.79 | 261.33 |
| 17 | GEORGETOWN | 14693.40 | 1.68 | 246.85 |
| 18 | BEAUFORT | 10490.81 | 2.31 | 242.34 |
| 19 | CHESTERFIELD | 14029.76 | 1.58 | 221.67 |
| 20 | ANDERSON | 6238.59 | 3.41 | 212.74 |
| 21 | YORK | 6997.53 | 2.86 | 200.13 |
| 22 | JASPER | 18028.36 | 1.08 | 194.71 |
| 23 | KERSHAW | 12403.09 | 1.38 | 171.16 |
| 24 | PICKENS | 6922.36 | 2.25 | 155.75 |
| 25 | GREENWOOD | 8555.96 | 1.65 | 141.17 |
| 26 | MARLBORO | 8473.49 | 1.58 | 133.88 |
| 27 | LAURENS | 6495.81 | 2.00 | 129.92 |
| 28 | HAMPTON | 9752.92 | 1.20 | 117.04 |
| 29 | CHEROKEE | 7350.64 | 1.58 | 116.14 |
| 30 | DILLON | 7406.49 | 1.48 | 109.62 |
| 31 | LEE | 9109.87 | 1.19 | 108.41 |
| 32 | OCONEE | 5543.09 | 1.73 | 95.90 |
| 33 | FAIRFIELD | 7547.90 | 1.20 | 90.57 |
| 34 | LANCASTER | 5332.71 | 1.61 | 85.86 |
| 35 | BAMBERG | 5707.48 | 1.31 | 74.77 |
| 36 | CHESTER | 5607.57 | 1.29 | 72.34 |
| 37 | BARNWELL | 5715.21 | 1.21 | 69.15 |
| 38 | ABBEVILLE | 5908.49 | 1.10 | 64.99 |
| 39 | MCCORMICK | 4417.24 | 1.42 | 62.72 |
| 40 | NEWBERRY | 4915.49 | 1.24 | 60.95 |
| 41 | UNION | 4761.09 | 1.21 | 57.61 |
| 42 | ALLENDALE | 3850.14 | 1.25 | 48.13 |
| 43 | CALHOUN | 5401.44 | 0.88 | 47.53 |
| 44 | MARION | 5243.02 | 0.78 | 40.90 |
| 45 | SALUDA | 4596.04 | 0.86 | 39.53 |
| 46 | EDGEFIELD | 4107.70 | 0.92 | 37.79 |

***Note: Probability of Occurrence and Place Vulnerability do not include transportation accidents. Total Place Vulnerability Score has been divided by 100 to scale large scores.**

## Table 3.2: Counties Ranked by Place Vulnerability Scores According to Individual Hazard

| Rank | County | Hurr/TS | Tornado | Flood | Quake | Wildfire | HAZMAT | Winter | Drought | Transportation | Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CHARLESTON | 90.16 | 189.66 | 1316.35 | 61.71 | 61062.53 | 67933.21 | 49.91 | 2285.91 | 6465394.00 | 1329.89 |
| 2 | BERKELEY | 49.15 | 94.18 | 396.97 | 512.75 | 93449.76 | 5983.37 | 26.16 | 1203.39 | 834708.17 | 1017.16 |
| 3 | LEXINGTON | 37.35 | 96.50 | 323.74 | 7.52 | 90119.65 | 4957.05 | 41.36 | 1330.32 | 2167776.00 | 969.13 |
| 4 | HORRY | 61.24 | 266.36 | 1049.81 | 0.00 | 82902.12 | 8207.37 | 48.43 | 1396.36 | 3437761.33 | 939.32 |
| 5 | ORANGEBURG | 68.89 | 190.68 | 208.48 | 18.25 | 65539.12 | 5324.21 | 25.09 | 968.45 | 670231.83 | 723.43 |
| 6 | FLORENCE | 32.25 | 141.75 | 284.52 | 0.95 | 61255.76 | 2475.79 | 47.25 | 908.25 | 1196825.00 | 651.47 |
| 7 | WILLIAMSBURG | 25.55 | 25.71 | 87.10 | 0.00 | 60331.76 | 274.74 | 19.29 | 556.07 | 133620.00 | 613.20 |
| 8 | RICHLAND | 89.03 | 246.43 | 641.03 | 28.68 | 47861.65 | 6275.37 | 59.14 | 1902.43 | 5607124.00 | 571.04 |
| 9 | AIKEN | 22.00 | 110.71 | 200.00 | 5.03 | 52408.24 | 2692.11 | 22.14 | 1234.46 | 984198.33 | 566.95 |
| 10 | GREENVILLE | 41.10 | 204.75 | 2260.32 | 14.48 | 31775.06 | 14718.05 | 625.63 | 2855.13 | 6930241.50 | 524.95 |
| 11 | SUMTER | 38.46 | 62.91 | 131.13 | 0.88 | 36824.12 | 1925.53 | 29.04 | 933.98 | 642224.83 | 399.46 |
| 12 | SPARTANBURG | 30.97 | 222.86 | 1362.58 | 6.23 | 25129.41 | 10585.26 | 471.43 | 2134.29 | 3151440.00 | 399.43 |
| 13 | COLLETON | 30.68 | 32.21 | 148.13 | 1.06 | 37324.47 | 707.79 | 0.00 | 673.57 | 166760.67 | 389.18 |
| 14 | CLARENDON | 23.15 | 47.36 | 80.52 | 0.51 | 28667.29 | 238.11 | 13.93 | 537.64 | 107666.00 | 296.09 |
| 15 | DARLINGTON | 19.94 | 69.89 | 79.74 | 0.00 | 24732.12 | 1051.68 | 44.14 | 636.39 | 306528.00 | 266.34 |
| 16 | DORCHESTER | 27.72 | 47.95 | 138.58 | 111.00 | 23596.41 | 1460.26 | 15.98 | 735.18 | 396276.17 | 261.33 |
| 17 | GEORGETOWN | 22.76 | 30.00 | 287.23 | 1.09 | 21177.88 | 2634.95 | 12.00 | 519.00 | 210644.00 | 246.85 |
| 18 | BEAUFORT | 37.26 | 53.63 | 320.42 | 0.75 | 18439.24 | 4425.47 | 8.25 | 948.75 | 677715.50 | 242.34 |
| 19 | CHESTERFIELD | 20.39 | 47.96 | 91.74 | 1.03 | 21134.82 | 357.58 | 33.86 | 479.64 | 121791.67 | 221.67 |
| 20 | ANDERSON | 13.20 | 152.23 | 473.00 | 50.93 | 15946.76 | 2871.58 | 255.75 | 1510.14 | 1374741.50 | 212.74 |
| 21 | YORK | 20.30 | 71.50 | 313.68 | 0.93 | 13122.35 | 4967.37 | 163.43 | 1353.39 | 1184564.33 | 200.13 |
| 22 | JASPER | 18.81 | 15.43 | 83.61 | 0.00 | 18626.82 | 278.53 | 3.86 | 443.57 | 91080.00 | 194.71 |
| 23 | KERSHAW | 10.68 | 36.96 | 84.58 | 1.34 | 15456.00 | 893.37 | 27.11 | 606.21 | 160563.00 | 171.16 |
| 24 | PICKENS | 10.16 | 64.29 | 384.68 | 3.65 | 12454.41 | 1444.74 | 204.91 | 1008.48 | 451087.50 | 155.75 |
| 25 | GREENWOOD | 9.58 | 29.46 | 186.29 | 1.61 | 12258.53 | 851.05 | 67.77 | 713.04 | 268785.00 | 141.17 |
| 26 | MARLBORO | 18.35 | 33.86 | 76.45 | 0.00 | 12537.76 | 191.26 | 42.32 | 488.11 | 96485.33 | 133.88 |
| 27 | LAURENS | 14.19 | 32.14 | 206.45 | 3.90 | 10917.65 | 831.58 | 100.00 | 885.71 | 315033.33 | 129.92 |
| 28 | HAMPTON | 14.71 | 27.86 | 50.32 | 0.00 | 10877.65 | 233.68 | 6.43 | 492.86 | 41960.00 | 117.04 |
| 29 | CHEROKEE | 7.14 | 25.39 | 158.00 | 0.00 | 9396.35 | 1189.16 | 135.43 | 702.54 | 228810.33 | 116.14 |
| 30 | DILLON | 11.46 | 31.71 | 62.06 | 0.00 | 10011.76 | 358.32 | 29.07 | 457.21 | 139712.00 | 109.62 |
| 31 | LEE | 11.52 | 17.00 | 42.23 | 0.39 | 9996.00 | 350.74 | 12.75 | 410.13 | 43950.67 | 108.41 |
| 32 | OCONEE | 7.81 | 61.79 | 200.90 | 7.30 | 6848.76 | 1511.47 | 176.09 | 775.41 | 227985.17 | 95.90 |
| 33 | FAIRFIELD | 10.06 | 27.86 | 46.45 | 216.23 | 7778.82 | 429.47 | 21.43 | 527.14 | 63360.00 | 90.57 |
| 34 | LANCASTER | 13.50 | 25.88 | 93.48 | 0.00 | 7406.00 | 305.05 | 34.50 | 707.25 | 223038.67 | 85.86 |
| 35 | BAMBERG | 16.06 | 16.38 | 67.61 | 1.28 | 6688.71 | 186.16 | 9.36 | 491.25 | 32073.17 | 74.77 |
| 36 | CHESTER | 9.15 | 18.43 | 91.55 | 2.93 | 5827.76 | 597.47 | 76.02 | 610.45 | 97825.00 | 72.34 |
| 37 | BARNWELL | 9.37 | 36.73 | 50.74 | 2.36 | 6092.71 | 261.11 | 8.64 | 453.75 | 41301.33 | 69.15 |
| 38 | ABBEVILLE | 4.26 | 27.50 | 74.52 | 4.29 | 5752.35 | 110.00 | 51.07 | 475.36 | 38573.33 | 64.99 |
| 39 | MCCORMICK | 18.32 | 32.96 | 64.13 | 0.00 | 5262.35 | 306.42 | 17.75 | 570.54 | 23548.33 | 62.72 |
| 40 | NEWBERRY | 8.80 | 48.71 | 60.00 | 8.45 | 5120.47 | 332.84 | 22.14 | 493.79 | 107136.00 | 60.95 |
| 41 | UNION | 8.59 | 28.09 | 140.52 | 1.18 | 4797.29 | 191.05 | 58.34 | 535.86 | 67679.33 | 57.61 |
| 42 | ALLENDALE | 13.71 | 24.55 | 60.48 | 0.81 | 4000.00 | 190.79 | 8.93 | 513.39 | 18020.83 | 48.13 |
| 43 | CALHOUN | 11.35 | 12.57 | 45.42 | 0.57 | 4048.00 | 324.21 | 7.86 | 303.29 | 31738.67 | 47.53 |
| 44 | MARION | 5.03 | 11.14 | 35.23 | 2.28 | 3693.53 | 94.42 | 9.75 | 238.18 | 60372.00 | 40.90 |
| 45 | SALUDA | 3.33 | 12.29 | 30.52 | 0.56 | 3192.12 | 362.11 | 9.21 | 342.46 | 29555.33 | 39.53 |
| 46 | EDGEFIELD | 3.56 | 13.14 | 26.71 | 0.90 | 3187.53 | 174.32 | 6.57 | 366.36 | 37643.33 | 37.79 |

*Note: Place Vulnerability does not include transportation accidents and has been divided by 100 to scale large scores.

# 4 CONDUCT ASSESSMENT

## 4.1 Phase 1—Hazard Identification

The assessment process begins with the identification of all the principal hazards threatening the community. Each South Carolina county and municipality has a unique combination of natural, technological, and societal hazards that could harm specific areas or damage important community functions. Because this assessment was generated for use at the state level, only those hazards listed in the *South Carolina Emergency Operations Plan 2002* (EOP) are included. Table 4.1 provides a list of the hazards included. Hazards are presented in the order they appear in the state EOP.

**Table 4.1: Hazard Identification**

| Hazard |
|---|
| Hurricane/Tropical Storm |
| Tornado |
| Flood |
| Nuclear Power Plants |
| Earthquake |
| Fire-wildfire and structural |
| Hazardous Materials—fixed facility and transportation (rail, water, roadway) |
| Terrorism |
| Transportation—Motor vehicle accidents |
| Civil Disorder |
| Dam Failure |
| Severe Winter Storm |
| Drought |

## 4.2 Phase 2—Data Acquisition

Frequency data were initially gathered from the *South Carolina Atlas of Environmental Risks and Hazards* (Cutter et al. 1999) for events between 1975-1996. These data then were updated through 2005 by USC's Hazards Research Lab based on data from the National Climatic Data Center (NCDC) Storm Data and SHELDUS (Spatial Hazard Event and Loss Database for the U.S., www.sheldus.org).

## 4.3 Phase 3—Hazard Frequency of Occurrence

The estimated occurrence of the hazard is a useful element in the assessment. One can easily distinguish between infrequent hazards like earthquakes and frequent hazards like hazardous materials incidents based on frequency of occurrence.

The hazard frequency of occurrence is a simple calculation based on historical data and the length of that record in years. The number of hazard occurrences divided by

the number of years in the record yields the probability of the event occurring in any given year.

***Example:*** *If hypothetical hazard "A" occurred 17 times over the past 20 years, the probability of occurrence for that hazard "A" in any given year is 17/20 or 0.85 or less than once per year.*

Some hazards are geographically specific (e.g. flooding) and should have a frequency of occurrence score assigned to only a targeted area or hazard zone. Because the intention of this assessment is for use at the state level, no sub-county data or zoning are included. The calculated scores are for the entire county. Table 4.2 is an example of the calculation for all Oconee County hazards. The "*" symbol indicates there is no record of events.

**Table 4.2: Hazard Profile for Oconee County**

| Hazard | Number of Events | Years in Record | Recurrence Interval (Years) | Hazard Frequency % Chance per year |
|---|---|---|---|---|
| **Hurricane/Tropical Storm** | 7 | 155 | 22.14 | 4.52 |
| **Tornado** | 20 | 56 | 2.80 | 35.71 |
| **Flood** | 36 | 31 | 0.86 | 116.13 |
| **Nuclear Power Plants** | * | * | * | * |
| **Earthquake** | 13 | 308 | 23.69 | 4.22 |
| **Fire - wildfire and structural** | 673 | 17 | 0.03 | 3958.82 |
| **Hazardous materials (Hazmat)-- fixed facility and transportation** | 166 | 19 | 0.11 | 873.68 |
| **Terrorism** | * | * | * | * |
| **Transportation - motor vehicle** | 7907 | 6 | 0.0008 | 131783.33 |
| **Civil Disorder** | * | * | * | * |
| **Dam Failure** | * | * | * | * |
| **Severe Winter Storm** | 57 | 56 | 0.98 | 101.79 |
| **Drought** | 251 | 56 | 0.22 | 448.21 |

****Note: Data represent wildfire hazard only.**

Variables for Table 4.2 were calculated using the following method:

1. The 'Number of Events' column is simply the number of recorded events summed over the number of years in the record. For example: County "X" had a total of three tornadoes in 1998, four in 1999, and 2 in 2000. For that particular hazard, County "X" had a total of nine tornado events in the three years researched.

**3 + 4 + 2 = 9**

2. The 'Years in Record' column is simply the number of years researched. Three years were used in the previous example.

3. The 'Recurrence Interval (years)' column is the calculated number of times an event can occur in any given year. To determine the 'Recurrence Interval (years)' divide the 'Years in Record' by the 'Number of Events'.

$$\textbf{Recurrence Interval (years)} = \frac{\textbf{Years in Record}}{\textbf{Number of Events}}$$

4. The 'Hazard Frequency % Chance/year' is the probability (or chance) that a hazard will occur in any given year. To determine the percentage, divide the 'Number of Events' by the 'Years in Record' and multiply by 100.

$$\textbf{Hazard Frequency \% Chance/year} = \frac{\textbf{Number of Events}}{\textbf{Years in Record}} \times \textbf{100}$$

Table 4.3 provides a summary of all hazard frequencies of occurrence for each county. The table was constructed by first calculating the frequency of occurrence scores for each individual hazard in each county. Those scores were summed to give a total hazard score. This score is used as an index to represent the ranking of counties in relation to the potential frequency of occurrence from all hazards in any given year. The summed totals were divided by 100 (to reduce the large numbers) and rounded to two digits.

## Table 4.3: Counties Ranked by Total Hazard Score

| Rank | County | Hurr/TS | Tornado | Flood | Quake | Wildfire | HAZMAT | Winter | Drought | Transportation | Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BERKELEY | 16.77 | 32.14 | 135.48 | 175.00 | 31894.12 | 2042.11 | 8.93 | 410.71 | 284883.33 | 34715.27 |
| 2 | WILLIAMSBURG | 14.19 | 14.29 | 48.39 | 0.00 | 33517.65 | 152.63 | 10.71 | 308.93 | 74233.33 | 34066.79 |
| 3 | ORANGEBURG | 24.52 | 67.86 | 74.19 | 6.49 | 23323.53 | 1894.74 | 8.93 | 344.64 | 238516.67 | 25744.90 |
| 4 | LEXINGTON | 9.68 | 25.00 | 83.87 | 1.95 | 23347.06 | 1284.21 | 10.71 | 344.64 | 561600.00 | 25107.12 |
| 5 | CHARLESTON | 16.13 | 33.93 | 235.48 | 11.04 | 10923.53 | 12152.63 | 8.93 | 408.93 | 1156600.00 | 23790.60 |
| 6 | COLLETON | 18.71 | 19.64 | 90.32 | 0.65 | 22758.82 | 431.58 | 0.00 | 410.71 | 101683.33 | 23730.44 |
| 7 | FLORENCE | 10.97 | 48.21 | 96.77 | 0.32 | 20835.29 | 842.11 | 16.07 | 308.93 | 407083.33 | 22158.68 |
| 8 | HORRY | 13.55 | 58.93 | 232.26 | 0.00 | 18341.18 | 1815.79 | 10.71 | 308.93 | 760566.67 | 20781.34 |
| 9 | CLARENDON | 14.84 | 30.36 | 51.61 | 0.32 | 18376.47 | 152.63 | 8.93 | 344.64 | 69016.67 | 18979.81 |
| 10 | AIKEN | 7.10 | 35.71 | 64.52 | 1.62 | 16905.88 | 868.42 | 7.14 | 398.21 | 317483.33 | 18288.61 |
| 11 | JASPER | 17.42 | 14.29 | 77.42 | 0.00 | 17247.06 | 257.89 | 3.57 | 410.71 | 84333.33 | 18028.36 |
| 12 | SUMTER | 14.19 | 23.21 | 48.39 | 0.32 | 13588.24 | 710.53 | 10.71 | 344.64 | 236983.33 | 14740.24 |
| 13 | GEORGETOWN | 13.55 | 17.86 | 170.97 | 0.65 | 12605.88 | 1568.42 | 7.14 | 308.93 | 125383.33 | 14693.40 |
| 14 | DORCHESTER | 15.48 | 26.79 | 77.42 | 62.01 | 13182.35 | 815.79 | 8.93 | 410.71 | 221383.33 | 14599.49 |
| 15 | CHESTERFIELD | 12.90 | 30.36 | 58.06 | 0.65 | 13376.47 | 226.32 | 21.43 | 303.57 | 77083.33 | 14029.76 |
| 16 | DARLINGTON | 9.68 | 33.93 | 38.71 | 0.00 | 12005.88 | 510.53 | 21.43 | 308.93 | 148800.00 | 12929.08 |
| 17 | KERSHAW | 7.74 | 26.79 | 61.29 | 0.97 | 11200.00 | 647.37 | 19.64 | 439.29 | 116350.00 | 12403.09 |
| 18 | BEAUFORT | 16.13 | 23.21 | 138.71 | 0.32 | 7982.35 | 1915.79 | 3.57 | 410.71 | 293383.33 | 10490.81 |
| 19 | RICHLAND | 16.13 | 44.64 | 116.13 | 5.19 | 8670.59 | 1136.84 | 10.71 | 344.64 | 1015783.33 | 10344.88 |
| 20 | HAMPTON | 12.26 | 23.21 | 41.94 | 0.00 | 9064.71 | 194.74 | 5.36 | 410.71 | 34966.67 | 9752.92 |
| 21 | LEE | 9.68 | 14.29 | 35.48 | 0.32 | 8400.00 | 294.74 | 10.71 | 344.64 | 36933.33 | 9109.87 |
| 22 | GREENWOOD | 5.81 | 17.86 | 112.90 | 0.97 | 7429.41 | 515.79 | 41.07 | 432.14 | 162900.00 | 8555.96 |
| 23 | MARLBORO | 11.61 | 21.43 | 48.39 | 0.00 | 7935.29 | 121.05 | 26.79 | 308.93 | 61066.67 | 8473.49 |
| 24 | SPARTANBURG | 6.45 | 46.43 | 283.87 | 1.30 | 5235.29 | 2205.26 | 98.21 | 444.64 | 656550.00 | 8321.46 |
| 25 | GREENVILLE | 6.45 | 32.14 | 354.84 | 2.27 | 4988.24 | 2310.53 | 98.21 | 448.21 | 1087950.00 | 8240.90 |
| 26 | FAIRFIELD | 8.39 | 23.21 | 38.71 | 180.19 | 6482.35 | 357.89 | 17.86 | 439.29 | 52800.00 | 7547.90 |
| 27 | DILLON | 7.74 | 21.43 | 41.94 | 0.00 | 6764.71 | 242.11 | 19.64 | 308.93 | 94400.00 | 7406.49 |
| 28 | CHEROKEE | 4.52 | 16.07 | 100.00 | 0.00 | 5947.06 | 752.63 | 85.71 | 444.64 | 144816.67 | 7350.64 |
| 29 | YORK | 7.10 | 25.00 | 109.68 | 0.32 | 4588.24 | 1736.84 | 57.14 | 473.21 | 414183.33 | 6997.53 |
| 30 | PICKENS | 4.52 | 28.57 | 170.97 | 1.62 | 5535.29 | 642.11 | 91.07 | 448.21 | 200483.33 | 6922.36 |
| 31 | LAURENS | 7.10 | 16.07 | 103.23 | 1.95 | 5458.82 | 415.79 | 50.00 | 442.86 | 157516.67 | 6495.81 |
| 32 | ANDERSON | 3.87 | 44.64 | 138.71 | 14.94 | 4676.47 | 842.11 | 75.00 | 442.86 | 403150.00 | 6238.59 |
| 33 | ABBEVILLE | 3.87 | 25.00 | 67.74 | 3.90 | 5229.41 | 100.00 | 46.43 | 432.14 | 35066.67 | 5908.49 |
| 34 | BARNWELL | 7.74 | 30.36 | 41.94 | 1.95 | 5035.29 | 215.79 | 7.14 | 375.00 | 34133.33 | 5715.21 |
| 35 | BAMBERG | 12.26 | 12.50 | 51.61 | 0.97 | 5105.88 | 142.11 | 7.14 | 375.00 | 24483.33 | 5707.48 |
| 36 | CHESTER | 7.10 | 14.29 | 70.97 | 2.27 | 4517.65 | 463.16 | 58.93 | 473.21 | 75833.33 | 5607.57 |
| 37 | OCONEE | 4.52 | 35.71 | 116.13 | 4.22 | 3958.82 | 873.68 | 101.79 | 448.21 | 131783.33 | 5543.09 |
| 38 | CALHOUN | 12.90 | 14.29 | 51.61 | 0.65 | 4600.00 | 368.42 | 8.93 | 344.64 | 36066.67 | 5401.44 |
| 39 | LANCASTER | 8.39 | 16.07 | 58.06 | 0.00 | 4600.00 | 189.47 | 21.43 | 439.29 | 138533.33 | 5332.71 |
| 40 | MARION | 6.45 | 14.29 | 45.16 | 2.92 | 4735.29 | 121.05 | 12.50 | 305.36 | 77400.00 | 5243.02 |
| 41 | NEWBERRY | 7.10 | 39.29 | 48.39 | 6.82 | 4129.41 | 268.42 | 17.86 | 398.21 | 86400.00 | 4915.49 |
| 42 | UNION | 7.10 | 23.21 | 116.13 | 0.97 | 3964.71 | 157.89 | 48.21 | 442.86 | 55933.33 | 4761.09 |
| 43 | SALUDA | 3.87 | 14.29 | 35.48 | 0.65 | 3711.76 | 421.05 | 10.71 | 398.21 | 34366.67 | 4596.04 |
| 44 | MCCORMICK | 12.90 | 23.21 | 45.16 | 0.00 | 3705.88 | 215.79 | 12.50 | 401.79 | 16583.33 | 4417.24 |
| 45 | EDGEFIELD | 3.87 | 14.29 | 29.03 | 0.97 | 3464.71 | 189.47 | 7.14 | 398.21 | 40916.67 | 4107.70 |
| 46 | ALLENDALE | 10.97 | 19.64 | 48.39 | 0.65 | 3200.00 | 152.63 | 7.14 | 410.71 | 14416.67 | 3850.14 |

***Note: Total Hazard Score does not include transportation accidents**

## 4.4 Phase 4—Identification of Vulnerable Population Subgroups

To assess potential damage and loss of lives from hazards, vulnerable populations and the areas where they reside must be identified. Each South Carolina county and municipality has a unique combination of vulnerable social groups. Following guidelines set by the *Handbook*; vulnerable subgroups per county were determined using Census 2000 data. These subgroups include: number of people under age 19, number of people over age 64, number of females, number nonwhite, total population, and number of housing units. Other variables included number of mobile homes and median family income. This list was based on research of the current risk literature and ongoing analyses conducted by the USC Hazards Research Lab. The two age group variables follow categories set forth by the SC State Budget and Control Board, Office of Research and Statistical Services. Also, because median family income is a better indicator of economic status than the mean house value variable used in the *Handbook*, only the median family income variable was included in this assessment.

## 4.5 Phase 5 and 6—Calculating Social Vulnerability Scores

The social vulnerability score is a simple calculation that determines the percentage of each variable per county. The number of each variable in the county was divided by the total number of each variable in the state to determine "X", and then scaled and summed to determine the total vulnerability score using the following formula:

$$X = \frac{\text{\# Mobile homes in county}}{\text{\# Mobile homes in state}}$$

*Example: Suppose county "A" has 4,170 mobile homes in the county and there are 235,863 mobile homes in the state. The "X" or percentage of mobile homes is equal to 0.018 or 1.8%.*

Next, the percentages were scaled. In order to do this you must calculate "X's" or percentages for each listed variable for each county. Then, determine which "X" within each variable has the highest value (maximum "X"). The maximum "X" is then used to determine the relative vulnerability score for each variable. This calculation places all values on the same scale.

$$\text{Mobile Home Score} = \frac{X}{\text{Maximum X}}$$

To determine the total vulnerability of each county, simply sum the calculated vulnerability scores across each variable for that county. Further instruction on this procedure can be found on page 17 of the *Handbook.*

Table 4.4 contains the scores for each social variable. This table also ranks counties by the total social vulnerability scores. The total scores are rounded to two digits.

## Table 4.4: Counties Ranked by Total Social Vulnerability Score

| Rank | County | < 19 | > 64 | Female | Nonwhite | Population | Housing | Mobile | Med. Income | Total Social Score |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GREENVILLE | 1.00 | 1.00 | 1.00 | 0.53 | 1.00 | 1.00 | 0.73 | 0.11 | 6.37 |
| 2 | RICHLAND | 0.79 | 0.82 | 0.82 | 0.73 | 0.82 | 0.87 | 0.51 | 0.23 | 5.59 |
| 3 | CHARLESTON | 0.85 | 0.69 | 0.85 | 1.00 | 0.84 | 0.80 | 0.35 | 0.14 | 5.52 |
| 4 | SPARTANBURG | 0.67 | 0.71 | 0.67 | 0.40 | 0.67 | 0.66 | 0.72 | 0.30 | 4.80 |
| 5 | HORRY | 0.45 | 0.65 | 0.52 | 0.24 | 0.52 | 0.75 | 1.00 | 0.40 | 4.52 |
| 6 | LEXINGTON | 0.59 | 0.49 | 0.57 | 0.21 | 0.57 | 0.56 | 0.85 | 0.02 | 3.86 |
| 7 | ANDERSON | 0.44 | 0.50 | 0.44 | 0.19 | 0.44 | 0.45 | 0.60 | 0.34 | 3.41 |
| 8 | AIKEN | 0.40 | 0.41 | 0.38 | 0.26 | 0.38 | 0.38 | 0.61 | 0.28 | 3.10 |
| 9 | YORK | 0.35 | 0.33 | 0.34 | 0.33 | 0.33 | 0.32 | 0.48 | 0.46 | 2.94 |
| 10 | BERKELEY | 0.43 | 0.25 | 0.36 | 0.29 | 0.38 | 0.34 | 0.55 | 0.34 | 2.93 |
| 11 | FLORENCE | 0.46 | 0.38 | 0.44 | 0.23 | 0.43 | 0.41 | 0.47 | 0.05 | 2.86 |
| 12 | ORANGEBURG | 0.26 | 0.27 | 0.25 | 0.36 | 0.24 | 0.24 | 0.53 | 0.66 | 2.81 |
| 13 | SUMTER | 0.31 | 0.26 | 0.28 | 0.33 | 0.28 | 0.26 | 0.44 | 0.55 | 2.71 |
| 14 | BEAUFORT | 0.30 | 0.41 | 0.31 | 0.22 | 0.32 | 0.37 | 0.36 | 0.02 | 2.31 |
| 15 | PICKENS | 0.28 | 0.28 | 0.28 | 0.07 | 0.29 | 0.28 | 0.44 | 0.33 | 2.25 |
| 16 | DARLINGTON | 0.19 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.37 | 0.60 | 2.06 |
| 17 | LAURENS | 0.19 | 0.20 | 0.19 | 0.12 | 0.18 | 0.19 | 0.41 | 0.52 | 2.00 |
| 18 | DORCHESTER | 0.11 | 0.11 | 0.10 | 0.16 | 0.10 | 0.10 | 0.24 | 0.88 | 1.80 |
| 19 | OCONEE | 0.29 | 0.19 | 0.25 | 0.17 | 0.25 | 0.23 | 0.29 | 0.11 | 1.79 |
| 20 | GEORGETOWN | 0.16 | 0.22 | 0.17 | 0.05 | 0.17 | 0.20 | 0.36 | 0.39 | 1.73 |
| 21 | GREENWOOD | 0.15 | 0.19 | 0.15 | 0.14 | 0.15 | 0.17 | 0.28 | 0.45 | 1.68 |
| 22 | WILLIAMSBURG | 0.18 | 0.21 | 0.18 | 0.14 | 0.17 | 0.17 | 0.16 | 0.43 | 1.65 |
| 23 | LANCASTER | 0.11 | 0.11 | 0.10 | 0.11 | 0.10 | 0.11 | 0.27 | 0.74 | 1.64 |
| 24 | COLLETON | 0.17 | 0.17 | 0.16 | 0.11 | 0.16 | 0.15 | 0.22 | 0.47 | 1.61 |
| 25 | CHEROKEE | 0.12 | 0.11 | 0.11 | 0.10 | 0.11 | 0.12 | 0.25 | 0.66 | 1.58 |
| 26 | CHESTERFIELD | 0.10 | 0.10 | 0.10 | 0.13 | 0.09 | 0.09 | 0.18 | 0.78 | 1.58 |
| 27 | MARION | 0.14 | 0.15 | 0.14 | 0.08 | 0.14 | 0.14 | 0.26 | 0.53 | 1.58 |
| 28 | CLARENDON | 0.09 | 0.10 | 0.09 | 0.11 | 0.09 | 0.09 | 0.24 | 0.74 | 1.56 |
| 29 | KERSHAW | 0.10 | 0.08 | 0.08 | 0.10 | 0.08 | 0.08 | 0.17 | 0.79 | 1.48 |
| 30 | DILLON | 0.08 | 0.08 | 0.08 | 0.10 | 0.08 | 0.07 | 0.12 | 0.82 | 1.42 |
| 31 | MARLBORO | 0.15 | 0.15 | 0.14 | 0.09 | 0.14 | 0.14 | 0.25 | 0.32 | 1.38 |
| 32 | CHESTER | 0.05 | 0.05 | 0.05 | 0.07 | 0.04 | 0.04 | 0.09 | 0.92 | 1.31 |
| 33 | NEWBERRY | 0.10 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 | 0.16 | 0.58 | 1.29 |
| 34 | UNION | 0.03 | 0.03 | 0.03 | 0.05 | 0.03 | 0.03 | 0.05 | 1.00 | 1.25 |
| 35 | FAIRFIELD | 0.09 | 0.12 | 0.10 | 0.08 | 0.10 | 0.10 | 0.17 | 0.49 | 1.24 |
| 36 | BAMBERG | 0.08 | 0.10 | 0.08 | 0.06 | 0.08 | 0.08 | 0.13 | 0.60 | 1.21 |
| 37 | BARNWELL | 0.07 | 0.06 | 0.06 | 0.07 | 0.06 | 0.06 | 0.15 | 0.67 | 1.21 |
| 38 | HAMPTON | 0.07 | 0.07 | 0.06 | 0.09 | 0.06 | 0.06 | 0.12 | 0.67 | 1.20 |
| 39 | LEE | 0.06 | 0.06 | 0.05 | 0.08 | 0.06 | 0.05 | 0.12 | 0.72 | 1.20 |
| 40 | ABBEVILLE | 0.06 | 0.06 | 0.05 | 0.08 | 0.05 | 0.05 | 0.11 | 0.73 | 1.19 |
| 41 | ALLENDALE | 0.07 | 0.09 | 0.07 | 0.05 | 0.07 | 0.07 | 0.13 | 0.55 | 1.10 |
| 42 | JASPER | 0.06 | 0.05 | 0.05 | 0.07 | 0.05 | 0.05 | 0.11 | 0.63 | 1.08 |
| 43 | EDGEFIELD | 0.06 | 0.06 | 0.06 | 0.07 | 0.06 | 0.06 | 0.11 | 0.44 | 0.92 |
| 44 | SALUDA | 0.04 | 0.05 | 0.04 | 0.05 | 0.04 | 0.04 | 0.10 | 0.52 | 0.88 |
| 45 | CALHOUN | 0.05 | 0.06 | 0.05 | 0.04 | 0.05 | 0.05 | 0.10 | 0.45 | 0.86 |
| 46 | MCCORMICK | 0.02 | 0.04 | 0.02 | 0.03 | 0.03 | 0.03 | 0.05 | 0.55 | 0.78 |

# 5 DETERMINE PLACE VULNERABILITY

## 5.1 Phase 7—Place Vulnerability

Place Vulnerability for a county was determined by multiplying its Total Hazard Score (hereafter referred to as Hazard Probability score), by the Total Social (Vulnerability) Score. Choropleth maps for each score category (Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability) are provided to give spatial representation of category scores. These maps were created using natural breaks. Results for each hazard category are explained, followed by a final hazard assessment. Any significant events that occurred during the update period (2001-2005) are noted. The analyses are presented by hazard in the order they appear in the state EOP.

## 5.2 Hurricane and Tropical Storms

Frequency data analyzed for the hurricane and tropical storm category represent **only** those hurricanes and tropical storms that made landfall in and/or whose tract intersected South Carolina between the years 1851 – 2005. For example, in 1989 Hurricane Hugo made landfall on the coastline near Charleston and passed through eleven counties before crossing into North Carolina. Borders of each county intersected by the hurricane track were recorded as having had one hurricane event. The following two track maps illustrate these patterns (Figure 5.1). These maps are based on the *South Carolina Atlas of Environmental Risks and Hazards* as updated by the USC Hazards Research Lab.

### 5.2.1 Hazard Probability Scores for Hurricane/Tropical Storm Hazard Category

Most coastal counties had medium to high Hazard Probability scores. Counties with the highest scores, however, were non-coastal counties. The only county included in the high probability category was Orangeburg. The top choropleth map in Figure 5.2 represents the Hazard Probability scores for the hurricane/tropical storm hazard category. Notice the number of inner coastal or non-coastal counties that fall into the medium to medium-high probability category. This is the result of more storms approaching our state from the Gulf during 1975-2005 rather than approaching from the Atlantic.

### 5.2.2 Social Vulnerability Scores

The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. The middle choropleth map in Figure 5.2 represents the Social Vulnerability scores for the state.

### 5.2.3 Place Vulnerability Scores for Hurricane/Tropical Storm Hazard Category

Five coastal plain counties fell in the medium-high to high range for Place Vulnerability. In addition to the coastal counties, Richland and Orangeburg Counties were the only to fall in the high category. This result is due to three hurricanes (David in 1979, Bob in 1985, and Hugo in 1989, and one tropical storm that crossed the state

during this time period, coupled with the high social vulnerability scores of these counties. Colleton County experienced 5 hurricanes and/or tropical storms during 1975-2005, but had a lower social vulnerability score. The bottom choropleth map in Figure 5.2 represents the total Place Vulnerability scores for the hurricane/tropical storm hazard.

Remember, not only are these results driven by demographic data, but this analysis also is based on **only** those hurricanes and tropical storms that made landfall in and/or whose track intersected the state. It is well known that coastal counties are adversely affected by the many hurricanes and tropical storms that never make landfall, but rather skirt the coast causing major damage from storm surges, wind, and large amounts of rainfall. The most recent example of this is Hurricane Floyd. In 1999, twenty-seven South Carolina counties were included in the Presidential Disaster Declaration for Hurricane Floyd. This storm never intersected South Carolina's borders, yet caused extensive damage in the state. Therefore, a high priority should be placed on preparing for these hazards, especially in coastal counties. All scores ranked by Place Vulnerability for the hurricane/tropical windstorm category are shown in Table 5.1.

### 5.2.4 Recent Hurricane and Tropical Storm Activity

South Carolina has been affected by four hurricanes or tropical storms since 2001. These events account for three injuries and $23.42 million in property damage for the state of South Carolina (Hazards Research Lab, 2006). Only two of these systems caused serious damage to people and property in South Carolina. Hurricane Charley was the first major tropical system to affect South Carolina during this time period. Charley made initial landfall on Florida's west coast as a category four hurricane, but weakened as it left Florida's east coast. Taking a northerly track, Charley made a second landfall near Cape Romain as a weak category one hurricane. Nearly 180,000 people evacuated Horry County in advance of the storm. Charley brought down trees, damaged roofs, and flooded coastal areas around the Grand Strand. More than 65,000 residents lost power and insurance claims totaling $5 million along the grand strand were reported (NCDC Storm Data Online, 2006).

Tropical Storm Gaston impacted Berkeley, Charleston, and Dorchester Counties on August 29, 2004, causing $16.6 million dollars in property damage in Charleston and Berkeley Counties (NCDC Storm Data Online, 2006). Gaston came ashore near Bulls Bay with sustained 70 mph winds, which knocked down numerous trees and large limbs. Major damage was reported to over 3000 structures and power loss to over 150,000 people. A storm surge of 4 to 4.5 feet caused localized flooding.

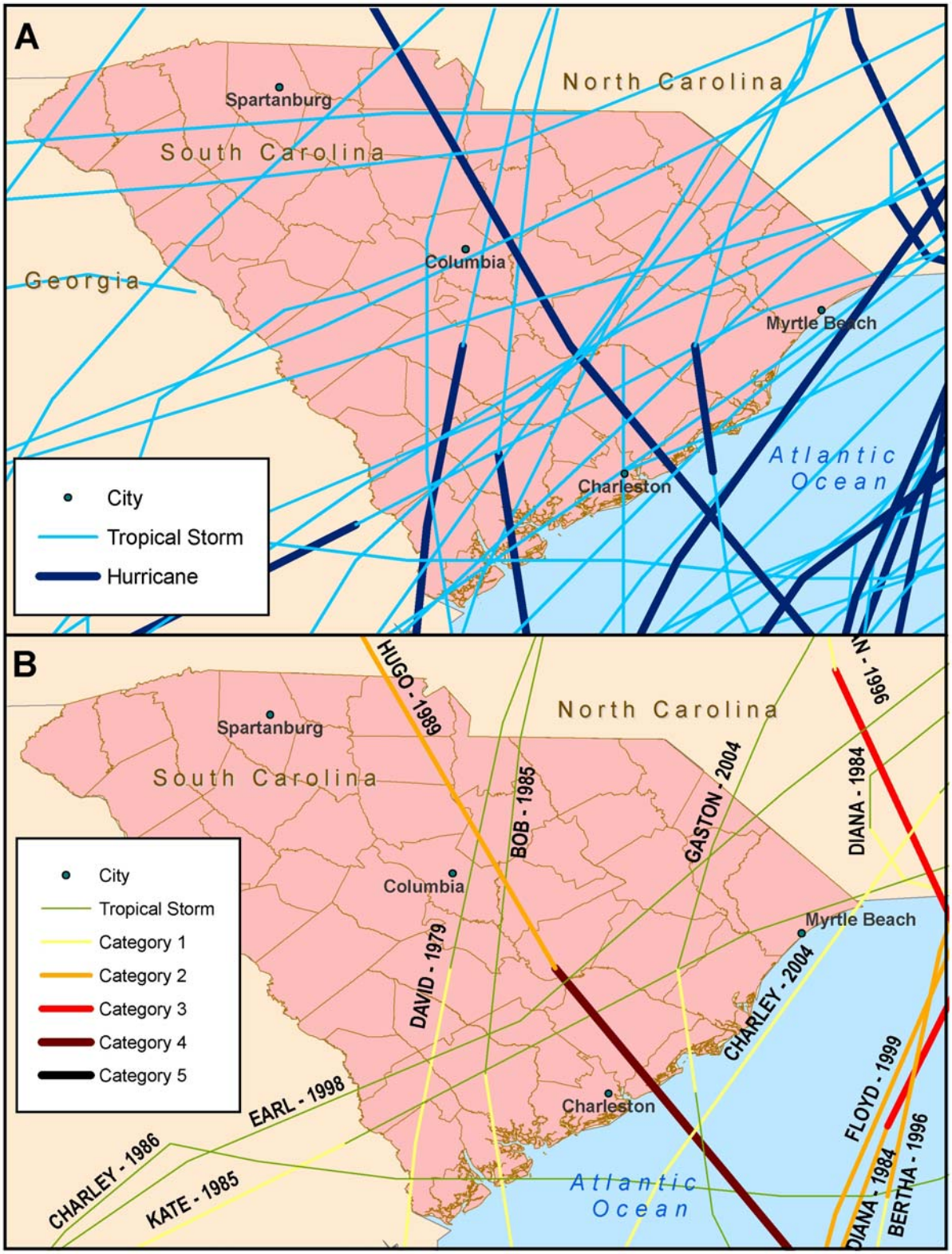


**Figure 5.1: A – Hurricanes and Tropical Storms Passing within 100 miles of South Carolina 1975-2005; B – Hurricanes within 100 Miles that Affected South Carolina 1975 – 2005.**

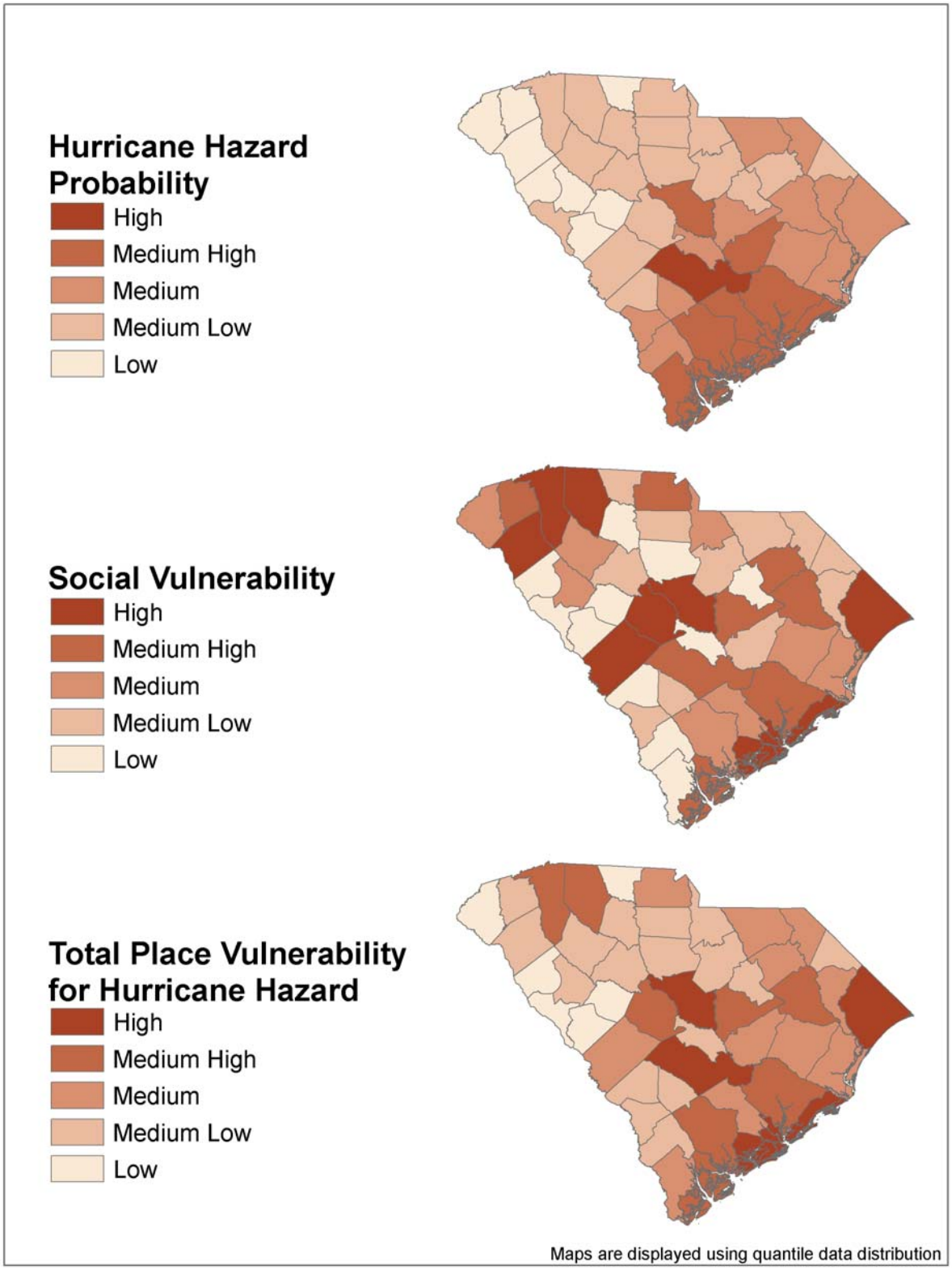


**Figure 5.2: Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability Scores for Hurricane and Tropical Storm Hazards**

**Table 5.1: Counties Ranked by Place Vulnerability for Hurricane/Tropical Storm**

| Rank | County | Probability of Occurrence | Social Vulnerability Score | Place Vulnerability Score |
|---|---|---|---|---|
| 1 | CHARLESTON | 16.13 | 5.59 | 90.16 |
| 2 | RICHLAND | 16.13 | 5.52 | 89.03 |
| 3 | ORANGEBURG | 24.52 | 2.81 | 68.89 |
| 4 | HORRY | 13.55 | 4.52 | 61.24 |
| 5 | BERKELEY | 16.77 | 2.93 | 49.15 |
| 6 | GREENVILLE | 6.45 | 6.37 | 41.10 |
| 7 | SUMTER | 14.19 | 2.71 | 38.46 |
| 8 | LEXINGTON | 9.68 | 3.86 | 37.35 |
| 9 | BEAUFORT | 16.13 | 2.31 | 37.26 |
| 10 | FLORENCE | 10.97 | 2.94 | 32.25 |
| 11 | SPARTANBURG | 6.45 | 4.80 | 30.97 |
| 12 | COLLETON | 18.71 | 1.64 | 30.68 |
| 13 | DORCHESTER | 15.48 | 1.79 | 27.72 |
| 14 | WILLIAMSBURG | 14.19 | 1.80 | 25.55 |
| 15 | CLARENDON | 14.84 | 1.56 | 23.15 |
| 16 | GEORGETOWN | 13.55 | 1.68 | 22.76 |
| 17 | AIKEN | 7.10 | 3.10 | 22.00 |
| 18 | CHESTERFIELD | 12.90 | 1.58 | 20.39 |
| 19 | YORK | 7.10 | 2.86 | 20.30 |
| 20 | DARLINGTON | 9.68 | 2.06 | 19.94 |
| 21 | JASPER | 17.42 | 1.08 | 18.81 |
| 22 | MARLBORO | 11.61 | 1.58 | 18.35 |
| 23 | MCCORMICK | 12.90 | 1.42 | 18.32 |
| 24 | BAMBERG | 12.26 | 1.31 | 16.06 |
| 25 | HAMPTON | 12.26 | 1.20 | 14.71 |
| 26 | LAURENS | 7.10 | 2.00 | 14.19 |
| 27 | ALLENDALE | 10.97 | 1.25 | 13.71 |
| 28 | LANCASTER | 8.39 | 1.61 | 13.50 |
| 29 | ANDERSON | 3.87 | 3.41 | 13.20 |
| 30 | LEE | 9.68 | 1.19 | 11.52 |
| 31 | DILLON | 7.74 | 1.48 | 11.46 |
| 32 | CALHOUN | 12.90 | 0.88 | 11.35 |
| 33 | KERSHAW | 7.74 | 1.38 | 10.68 |
| 34 | PICKENS | 4.52 | 2.25 | 10.16 |
| 35 | FAIRFIELD | 8.39 | 1.20 | 10.06 |
| 36 | GREENWOOD | 5.81 | 1.65 | 9.58 |
| 37 | BARNWELL | 7.74 | 1.21 | 9.37 |
| 38 | CHESTER | 7.10 | 1.29 | 9.15 |
| 39 | NEWBERRY | 7.10 | 1.24 | 8.80 |
| 40 | UNION | 7.10 | 1.21 | 8.59 |
| 41 | OCONEE | 4.52 | 1.73 | 7.81 |
| 42 | CHEROKEE | 4.52 | 1.58 | 7.14 |
| 43 | MARION | 6.45 | 0.78 | 5.03 |
| 44 | ABBEVILLE | 3.87 | 1.10 | 4.26 |
| 45 | EDGEFIELD | 3.87 | 0.92 | 3.56 |
| 46 | SALUDA | 3.87 | 0.86 | 3.33 |

## 5.3 Tornadoes

Tornado hazard frequency data represent the number of documented incidents or reported tornado touchdowns per county from 1950 – 2005.

### 5.3.1 Hazard Probability Scores for Tornado Hazard Category

Several counties fell in the medium-high to high range. Those in the highest probability range were Orangeburg and Horry Counties. The top choropleth map in Figure 5.3 represents the Hazard Probability scores for the tornado hazard.

### 5.3.2 Social Vulnerability Scores

The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. The middle choropleth map in Figure 5.3 represents the Social Vulnerability scores for the state.

### 5.3.3 Place Vulnerability Scores for Tornado Hazard Category

The counties displaying the greatest place vulnerability to the tornado threat are scattered throughout the state and include Charleston, Richland, Orangeburg, Horry, Greenville and Spartanburg Counties. Three clusters of medium to medium-high levels of tornado place vulnerability can be seen in the bottom choropleth map in Figure 5.3. The first, in the upstate, includes all counties to the west of Greenville. The second, in the midlands, includes the counties along the I-20 corridor west towards Georgia. The third cluster, along the coast, includes Berkeley, Dorchester, and Charleston Counties. For these counties, a priority should be placed on preparing for this hazard. Scores for the tornado hazard are in Table 5.2, which also ranks counties by Place Vulnerability Scores.

### 5.3.4 Recent Tornado Activity

South Carolina has been affected by one hundred and fifty-one tornadoes since 2001. These events have caused one fatality, eighty-seven injuries, and $17.26 million in property damage (Hazards Research Lab, 2006). Eighty-nine of these tornadoes were magnitude F0 events causing less than $250,000 in total damage and no injuries or fatalities. There were fifty-two F1 tornadoes during this time period in South Carolina and only eight F2 tornadoes. There have been no major tornado events (F3 or higher) since 2001. A few of the more significant incidents will be covered here.

On July 6, 2001, an outbreak of tornadoes caused thirty-nine injuries and over $8 million in property damage in Horry County. One of these tornadoes, originally formed over water (a waterspout), but moved onto land in Myrtle Beach, increased in intensity caused damage commensurate with an F2 event. It overturned vehicles, caused damage to hotels along the beach, then destroyed 10 RV's and damaged 40 more in the Seagate RV Park) (NCDC Storm Data Reports Online, 2006).

A strong F2 tornado touched down in Georgetown County on October 11, 2002, destroying 5 manufactured homes, a car and 2 houses before continuing along a northeastern path for a mile through a residential area of Georgetown, causing damage to 28 structures and minor damage to 78 more, including homes, businesses, and churches (NCDC Storm Data Reports Online, 2006). Eight people to be hospitalized for minor injuries and property damage was estimated at over $750,000.

An F1 tornado touched down just west of Cheraw in Chesterfield County causing $800,000 in property damage. Several single family and mobile homes had moderate damage and one mobile home was severely damaged. Several businesses near Cheraw had minor to moderate damage and a power substation also sustained moderate damage causing power outages in the area.

An F2 tornado on September 4, 2004 caused three injuries and $1.7 million in property damage in Sumter County. Emergency managers reported major damage to 55 homes and the destruction of nine homes. Lastly, an F2 tornado touched down north of Laurens on January 13, 2005, causing one injury and $2 million in property damage—mostly destroyed mobile homes and small sheds, damaged roofs, and uprooted large trees.

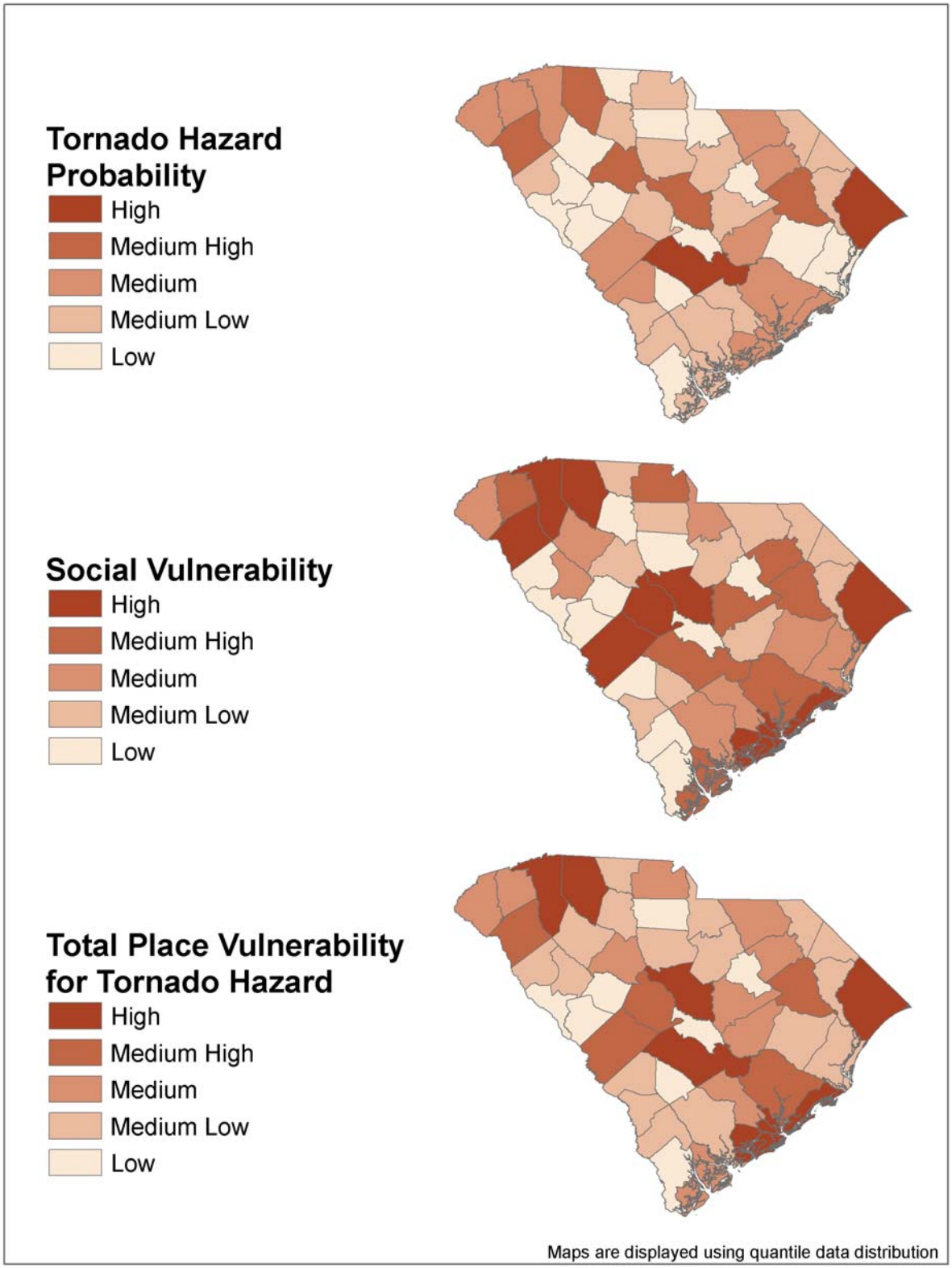


**Figure 5.3: Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability Scores for Tornado Hazards**

## Table 5.2: Counties Ranked by Place Vulnerability for Tornadoes

| Rank | County | Probability of Occurrence | Social Vulnerability Score | Place Vulnerability Score |
|---|---|---|---|---|
| 1 | HORRY | 58.93 | 4.52 | 266.36 |
| 2 | RICHLAND | 44.64 | 5.52 | 246.43 |
| 3 | SPARTANBURG | 46.43 | 4.80 | 222.86 |
| 4 | GREENVILLE | 32.14 | 6.37 | 204.75 |
| 5 | ORANGEBURG | 67.86 | 2.81 | 190.68 |
| 6 | CHARLESTON | 33.93 | 5.59 | 189.66 |
| 7 | ANDERSON | 44.64 | 3.41 | 152.23 |
| 8 | FLORENCE | 48.21 | 2.94 | 141.75 |
| 9 | AIKEN | 35.71 | 3.10 | 110.71 |
| 10 | LEXINGTON | 25.00 | 3.86 | 96.50 |
| 11 | BERKELEY | 32.14 | 2.93 | 94.18 |
| 12 | YORK | 25.00 | 2.86 | 71.50 |
| 13 | DARLINGTON | 33.93 | 2.06 | 69.89 |
| 14 | PICKENS | 28.57 | 2.25 | 64.29 |
| 15 | SUMTER | 23.21 | 2.71 | 62.91 |
| 16 | OCONEE | 35.71 | 1.73 | 61.79 |
| 17 | BEAUFORT | 23.21 | 2.31 | 53.63 |
| 18 | NEWBERRY | 39.29 | 1.24 | 48.71 |
| 19 | CHESTERFIELD | 30.36 | 1.58 | 47.96 |
| 20 | DORCHESTER | 26.79 | 1.79 | 47.95 |
| 21 | CLARENDON | 30.36 | 1.56 | 47.36 |
| 22 | KERSHAW | 26.79 | 1.38 | 36.96 |
| 23 | BARNWELL | 30.36 | 1.21 | 36.73 |
| 24 | MARLBORO | 21.43 | 1.58 | 33.86 |
| 25 | MCCORMICK | 23.21 | 1.42 | 32.96 |
| 26 | COLLETON | 19.64 | 1.64 | 32.21 |
| 27 | LAURENS | 16.07 | 2.00 | 32.14 |
| 28 | DILLON | 21.43 | 1.48 | 31.71 |
| 29 | GEORGETOWN | 17.86 | 1.68 | 30.00 |
| 30 | GREENWOOD | 17.86 | 1.65 | 29.46 |
| 31 | UNION | 23.21 | 1.21 | 28.09 |
| 32 | HAMPTON | 23.21 | 1.20 | 27.86 |
| 33 | FAIRFIELD | 23.21 | 1.20 | 27.86 |
| 34 | ABBEVILLE | 25.00 | 1.10 | 27.50 |
| 35 | LANCASTER | 16.07 | 1.61 | 25.88 |
| 36 | WILLIAMSBURG | 14.29 | 1.80 | 25.71 |
| 37 | CHEROKEE | 16.07 | 1.58 | 25.39 |
| 38 | ALLENDALE | 19.64 | 1.25 | 24.55 |
| 39 | CHESTER | 14.29 | 1.29 | 18.43 |
| 40 | LEE | 14.29 | 1.19 | 17.00 |
| 41 | BAMBERG | 12.50 | 1.31 | 16.38 |
| 42 | JASPER | 14.29 | 1.08 | 15.43 |
| 43 | EDGEFIELD | 14.29 | 0.92 | 13.14 |
| 44 | CALHOUN | 14.29 | 0.88 | 12.57 |
| 45 | SALUDA | 14.29 | 0.86 | 12.29 |
| 46 | MARION | 14.29 | 0.78 | 11.14 |

## 5.4 Flood

Flood data represent all flash, riverine, and urban flooding events between 1975-2005.

### 5.4.1 Hazard Probability Scores for Flood Hazard Category

Counties located in the coastal plain and in the upstate generally have higher levels of flood hazard probability than those counties located in the midlands. Greenville, Spartanburg, Horry and Charleston Counties have the greatest probability of flood hazard occurrence. Georgetown and Berkeley Counties (along the coast) and Pickens and Anderson Counties (in the upstate) all have moderately high levels of flood hazard probability. The top choropleth map in Figure 5.4 represents the Hazard Probability scores for the flood hazard.

### 5.4.2 Social Vulnerability Scores

The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. The middle choropleth map in Figure 5.4 represents the Social Vulnerability scores for the state.

### 5.4.3 Place Vulnerability Scores for Flood Hazard Category

Greenville has the greatest place vulnerability to flood hazards, but Spartanburg, Charleston, and Horry Counties also appear in the highest category of Place Vulnerability. Since flooding is associated with many hazards including hurricane, tropical storm, summer storms, dam failures, and even occasional snowmelt, a priority for many counties should be on preparing for this hazard. The bottom choropleth map in Figure 5.4 represents the Place Vulnerability scores for the flood hazard. Scores for the flood hazard category are in Table 5.3. This table ranks counties by Place Vulnerability scores.

### 5.4.4 Recent Flood Activity

Two hundred eighty-four flood events totaling two deaths, one injury, $14.89 million in property damage and $5 million in crop damage have occurred in South Carolina since 2001 (NCDC Storm Data Reports Online, 2006). Five of these are significant events (causing more than $1 million in property or crop damage) in our state. The first event was the Greater Greenville flood of March 20, 2003, which caused $1.3 million in property damage in Greenville and over $1.0 million in Spartanburg. Heavy overnight rainfall produced flash flooding, and continued moderate rainfall resulted in additional flooding along many creeks and streams in areas of Greenville County. The flooding was quite significant in Berera, Taylors, and Mauldin. In Berea, some residents had to be rescued via canoe from their homes (NCDC Storm Data Reports Online).

Another flood event caused by heavy rainfall occurred on September 7, 2004 in Oconee and Greenville counties causing an estimated $2.6 million in property damage and $5 million in crop damage. Widespread flooding of creeks and streams developed

across the two counties. Numerous roads were covered with water or washed out, and the sewer systems of several communities were damaged.

Another large flash-flooding event hit Greenville on July 29, 2004 causing $3.5 million in property damage. A nearly stationary thunderstorm produced 4 to 9 inches of rainfall in approximately 4 hours resulting in major flooding in areas from Berea to downtown Greenville. The Reedy River crested at 19.2 feet in downtown Greenville, the second highest level on record (NCDC Storm Data reports Online, 2006). Several businesses and homes along the river incurred major damage, hundreds of vehicles were damaged or destroyed, and numerous roads and bridges were damaged or washed out. At least 30 homes were condemned (NCDC Storm Data Reports, 2006).

A flash flood on July 7, 2005 in Greenville, Pickens, and Spartanburg caused $1.8 million in property damage as more than thirty homes were inundated by floodwaters. More than 100 people had to be rescued from various locations throughout these counties as floodwaters washed out roadways and bridges across the three counties. Most recently, a flash flood event on August 10, 2005 caused $1.5 million in property damage when a pond overflowed into a new subdivision in Spartanburg County, affecting fifteen new homes.

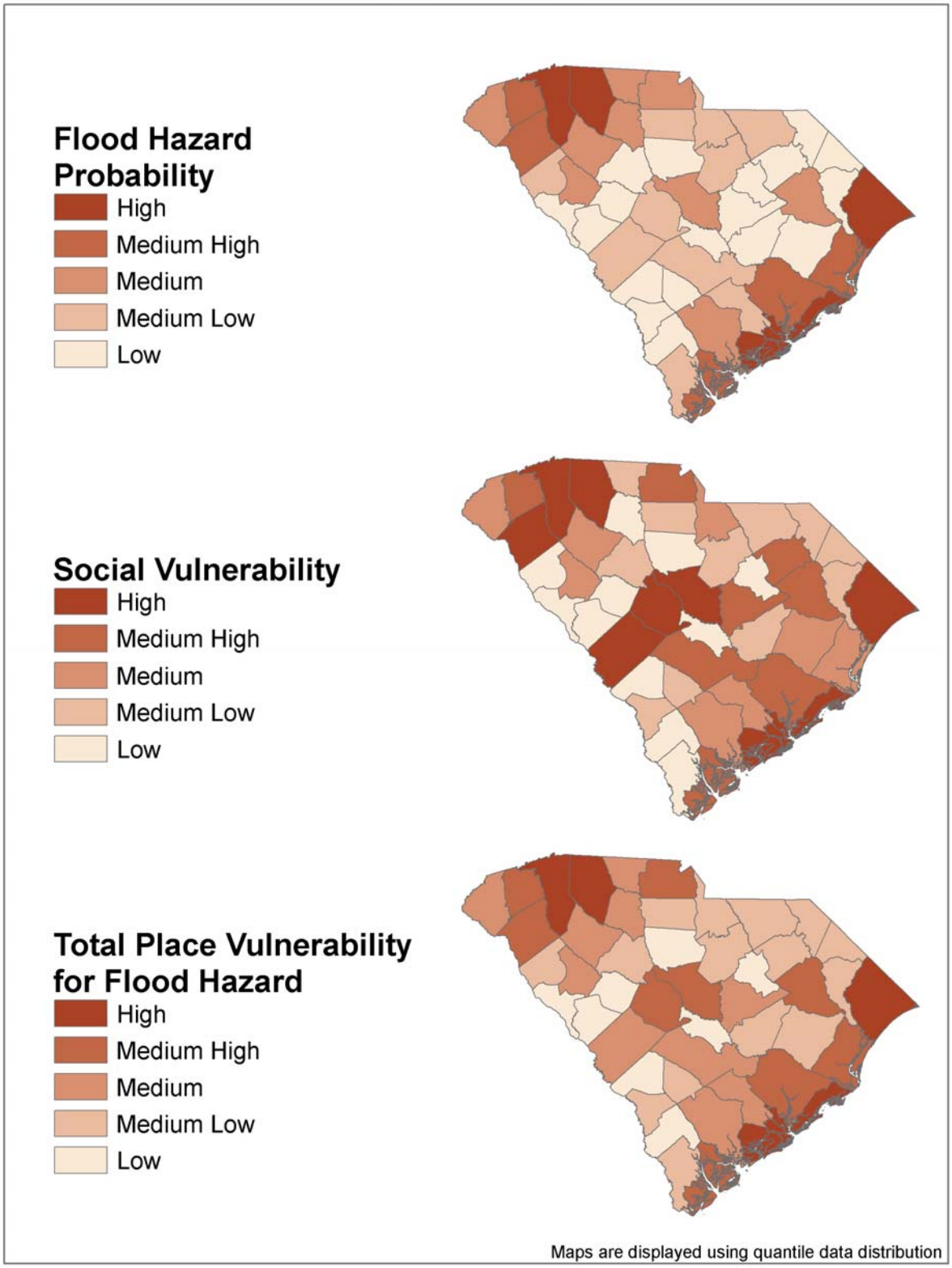


**Figure 5.4: Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability Scores for Flood Hazards**

**Table 5.3: Counties Ranked by Place Vulnerability for Floods**

| Rank | County | Probability of Occurrence | Social Vulnerability Score | Place Vulnerability Score |
|---|---|---|---|---|
| 1 | GREENVILLE | 354.84 | 6.37 | 2260.32 |
| 2 | SPARTANBURG | 283.87 | 4.80 | 1362.58 |
| 3 | CHARLESTON | 235.48 | 5.59 | 1316.35 |
| 4 | HORRY | 232.26 | 4.52 | 1049.81 |
| 5 | RICHLAND | 116.13 | 5.52 | 641.03 |
| 6 | ANDERSON | 138.71 | 3.41 | 473.00 |
| 7 | BERKELEY | 135.48 | 2.93 | 396.97 |
| 8 | PICKENS | 170.97 | 2.25 | 384.68 |
| 9 | LEXINGTON | 83.87 | 3.86 | 323.74 |
| 10 | BEAUFORT | 138.71 | 2.31 | 320.42 |
| 11 | YORK | 109.68 | 2.86 | 313.68 |
| 12 | GEORGETOWN | 170.97 | 1.68 | 287.23 |
| 13 | FLORENCE | 96.77 | 2.94 | 284.52 |
| 14 | ORANGEBURG | 74.19 | 2.81 | 208.48 |
| 15 | LAURENS | 103.23 | 2.00 | 206.45 |
| 16 | OCONEE | 116.13 | 1.73 | 200.90 |
| 17 | AIKEN | 64.52 | 3.10 | 200.00 |
| 18 | GREENWOOD | 112.90 | 1.65 | 186.29 |
| 19 | CHEROKEE | 100.00 | 1.58 | 158.00 |
| 20 | COLLETON | 90.32 | 1.64 | 148.13 |
| 21 | UNION | 116.13 | 1.21 | 140.52 |
| 22 | DORCHESTER | 77.42 | 1.79 | 138.58 |
| 23 | SUMTER | 48.39 | 2.71 | 131.13 |
| 24 | LANCASTER | 58.06 | 1.61 | 93.48 |
| 25 | CHESTERFIELD | 58.06 | 1.58 | 91.74 |
| 26 | CHESTER | 70.97 | 1.29 | 91.55 |
| 27 | WILLIAMSBURG | 48.39 | 1.80 | 87.10 |
| 28 | KERSHAW | 61.29 | 1.38 | 84.58 |
| 29 | JASPER | 77.42 | 1.08 | 83.61 |
| 30 | CLARENDON | 51.61 | 1.56 | 80.52 |
| 31 | DARLINGTON | 38.71 | 2.06 | 79.74 |
| 32 | MARLBORO | 48.39 | 1.58 | 76.45 |
| 33 | ABBEVILLE | 67.74 | 1.10 | 74.52 |
| 34 | BAMBERG | 51.61 | 1.31 | 67.61 |
| 35 | MCCORMICK | 45.16 | 1.42 | 64.13 |
| 36 | DILLON | 41.94 | 1.48 | 62.06 |
| 37 | ALLENDALE | 48.39 | 1.25 | 60.48 |
| 38 | NEWBERRY | 48.39 | 1.24 | 60.00 |
| 39 | BARNWELL | 41.94 | 1.21 | 50.74 |
| 40 | HAMPTON | 41.94 | 1.20 | 50.32 |
| 41 | FAIRFIELD | 38.71 | 1.20 | 46.45 |
| 42 | CALHOUN | 51.61 | 0.88 | 45.42 |
| 43 | LEE | 35.48 | 1.19 | 42.23 |
| 44 | MARION | 45.16 | 0.78 | 35.23 |
| 45 | SALUDA | 35.48 | 0.86 | 30.52 |
| 46 | EDGEFIELD | 29.03 | 0.92 | 26.71 |

## 5.5 Nuclear Power Plants

Although there are no data representative of nuclear power plant incidents, there are emergency operations plans in place in the event of an accident. South Carolina has 5 nuclear power plants in the state (Figure 5.5) and three others located in neighboring states. Four counties serve as host counties for the facilities (Oconee, York, Fairfield, Darlington). All but six of the state's counties fall within the 10-mile or 50-mile emergency- planning zone of at least one nuclear facility. These six are Beaufort, Berkeley, Charleston, Dorchester, Georgetown, and Jasper.

The following are some interesting statistics reported by Duke Power on typical nuclear power plants:

- There is about one chance in twenty thousand per year that a nuclear power plant will experience a serious accident, and

- About one chance in four million per year that anyone in the public would die as a direct result of a nuclear accident.

Although these statistics suggest that the chances of a serious accident are considered extremely low, annual updates of emergency operation plans for nuclear power plant incidents and regular training exercises are an absolute must to ensure the safety of the public and the environment.

### 5.5.1 Recent Nuclear Power Hazard Activity

There has been one incident involving radioactive material in the state of South Carolina since 2001. This incident, classified as a non-emergency event, by the Nuclear Regulatory Commission, involved surface contamination levels greater than their prescribed limits, occurred on May 27$^{th}$, 2004. Contamination levels in excess of USDOT (U.S. Department of Transportation) and Barnwell County limits were found on a shipment in a Sea Land container when it reached its destination. A condensation puddle inside the container leaked out onto the trailer bed. There were no personnel exposures.

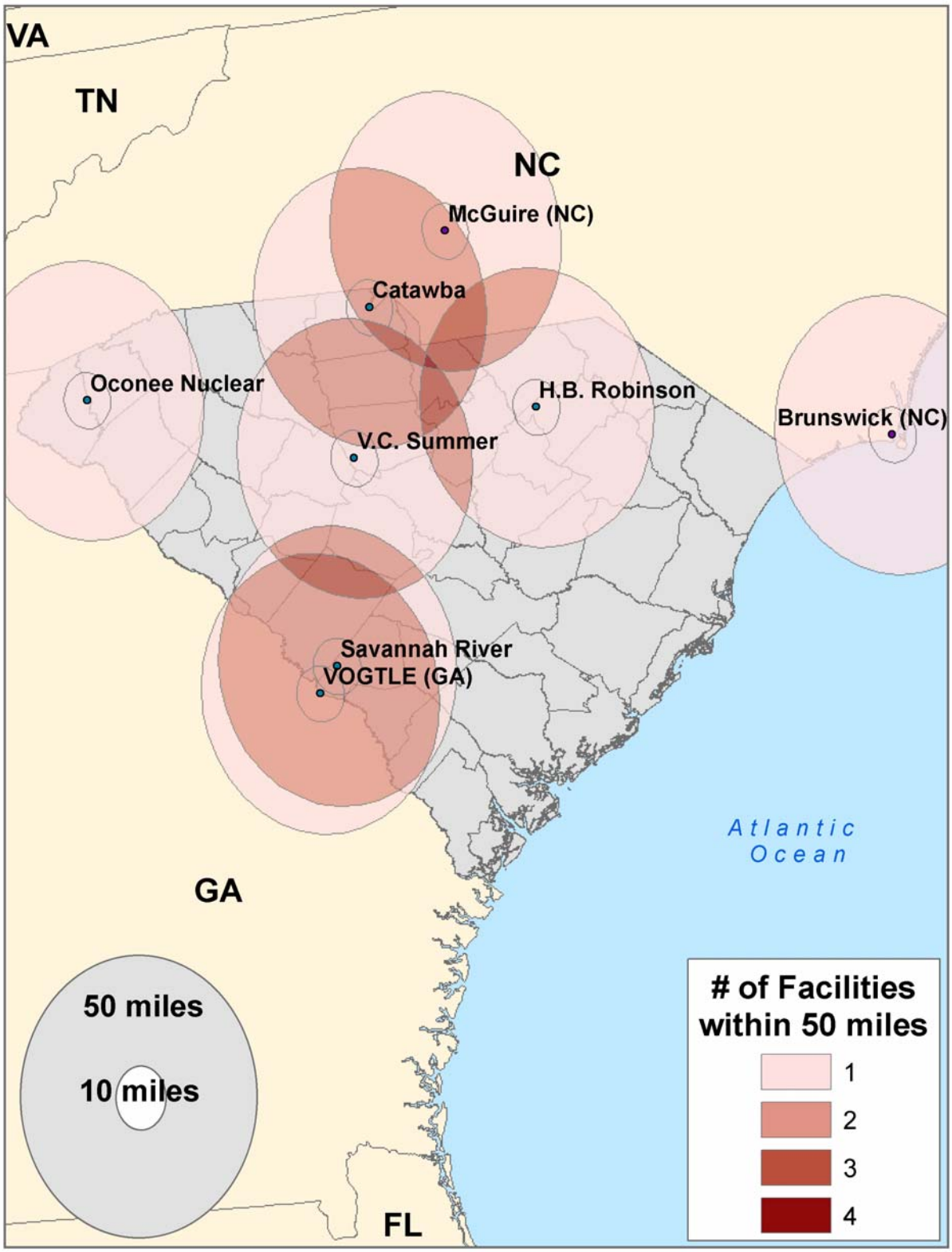


**Figure 5.5: Nuclear Facilities Affecting South Carolina**

## 5.6 Earthquake

Earthquake data represent recorded number of epicenters reported per county between 1698 – September 2005.

### 5.6.1 Hazard Probability Scores for Earthquake Hazard Category

Based on the frequency of recorded earthquake epicenters, Fairfield and Berkeley Counties have the highest annual frequency of earthquakes recording 555 and 539 events, respectively during the past 308 years. Dorchester was the only county in the medium high category with 191 events during the recorded time period. The top choropleth map in Figure 5.6 represents the Hazard Probability scores for the earthquake hazard.

### 5.6.2 Social Vulnerability Scores

The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. The middle choropleth map in Figure 5.6 represents the Social Vulnerability scores for the state.

### 5.6.3 Place Vulnerability Scores for Earthquake Hazard Category

Those counties that fell in the highest and medium high categories for the earthquake place vulnerability were Berkeley and Fairfield. These counties should place a priority on preparation for this hazard. However, it is understood that if an earthquake of the magnitude experienced in the 1886 Charleston quake reoccurs, damages would be catastrophic for a number of South Carolina counties. South Carolina Emergency Management Division's *Comprehensive Seismic Risk and Vulnerability Study for the State of South Carolina* (2001) provides a complete overview of the seismic risks within the state. The bottom choropleth map in Figure 5.6 represents the Place Vulnerability scores for the earthquake hazard category. Scores for the earthquake hazard category are in Table 5.4. This table also ranks counties by Place Vulnerability Scores.

### 5.6.4 Recent Earthquake Activity

There have been more than two hundred minimal earthquakes in South Carolina since 2001. None of these events caused any significant damage and many were not even strong enough to be felt by people. There have been no significant earthquakes during this time period. The counties that have had the greatest number of earthquakes during this time period are Fairfield County and Berkeley County with one hundred thirty-four and forty-one earthquakes respectively (South Carolina Seismic Network, 2006).

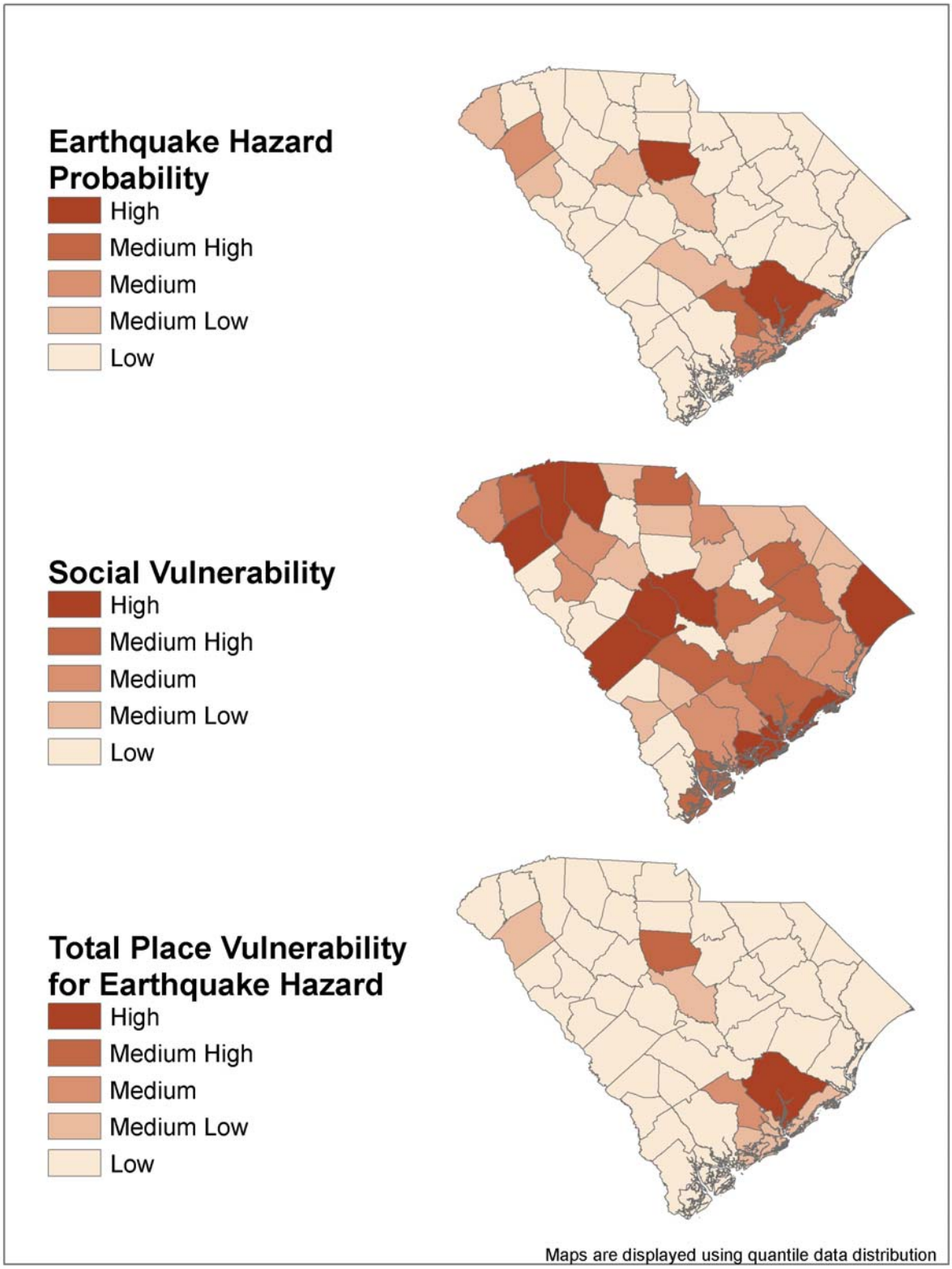


**Figure 5.6: Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability Scores for Earthquake Hazards**

**Table 5.4: Counties Ranked by Place Vulnerability for Earthquakes**

| Rank | County | Probability of Occurrence | Social Vulnerability Score | Place Vulnerability Score |
|---|---|---|---|---|
| 1 | BERKELEY | 175.00 | 2.93 | 512.75 |
| 2 | FAIRFIELD | 180.19 | 1.20 | 216.23 |
| 3 | DORCHESTER | 62.01 | 1.79 | 111.00 |
| 4 | CHARLESTON | 11.04 | 5.59 | 61.71 |
| 5 | ANDERSON | 14.94 | 3.41 | 50.93 |
| 6 | RICHLAND | 5.19 | 5.52 | 28.68 |
| 7 | ORANGEBURG | 6.49 | 2.81 | 18.25 |
| 8 | GREENVILLE | 2.27 | 6.37 | 14.48 |
| 9 | NEWBERRY | 6.82 | 1.24 | 8.45 |
| 10 | LEXINGTON | 1.95 | 3.86 | 7.52 |
| 11 | OCONEE | 4.22 | 1.73 | 7.30 |
| 12 | SPARTANBURG | 1.30 | 4.80 | 6.23 |
| 13 | AIKEN | 1.62 | 3.10 | 5.03 |
| 14 | ABBEVILLE | 3.90 | 1.10 | 4.29 |
| 15 | LAURENS | 1.95 | 2.00 | 3.90 |
| 16 | PICKENS | 1.62 | 2.25 | 3.65 |
| 17 | CHESTER | 2.27 | 1.29 | 2.93 |
| 18 | BARNWELL | 1.95 | 1.21 | 2.36 |
| 19 | MARION | 2.92 | 0.78 | 2.28 |
| 20 | GREENWOOD | 0.97 | 1.65 | 1.61 |
| 21 | KERSHAW | 0.97 | 1.38 | 1.34 |
| 22 | BAMBERG | 0.97 | 1.31 | 1.28 |
| 23 | UNION | 0.97 | 1.21 | 1.18 |
| 24 | GEORGETOWN | 0.65 | 1.68 | 1.09 |
| 25 | COLLETON | 0.65 | 1.64 | 1.06 |
| 26 | CHESTERFIELD | 0.65 | 1.58 | 1.03 |
| 27 | FLORENCE | 0.32 | 2.94 | 0.95 |
| 28 | YORK | 0.32 | 2.86 | 0.93 |
| 29 | EDGEFIELD | 0.97 | 0.92 | 0.90 |
| 30 | SUMTER | 0.32 | 2.71 | 0.88 |
| 31 | ALLENDALE | 0.65 | 1.25 | 0.81 |
| 32 | BEAUFORT | 0.32 | 2.31 | 0.75 |
| 33 | CALHOUN | 0.65 | 0.88 | 0.57 |
| 34 | SALUDA | 0.65 | 0.86 | 0.56 |
| 35 | CLARENDON | 0.32 | 1.56 | 0.51 |
| 36 | LEE | 0.32 | 1.19 | 0.39 |
| 37 | HORRY | 0.00 | 4.52 | 0.00 |
| 38 | CHEROKEE | 0.00 | 1.80 | 0.00 |
| 39 | LANCASTER | 0.00 | 2.06 | 0.00 |
| 40 | WILLIAMSBURG | 0.00 | 1.08 | 0.00 |
| 41 | JASPER | 0.00 | 1.58 | 0.00 |
| 42 | DARLINGTON | 0.00 | 1.20 | 0.00 |
| 43 | MARLBORO | 0.00 | 1.48 | 0.00 |
| 44 | MCCORMICK | 0.00 | 1.58 | 0.00 |
| 45 | DILLON | 0.00 | 1.61 | 0.00 |
| 46 | HAMPTON | 0.00 | 1.42 | 0.00 |

## 5.7 Fire

### 5.7.1 Wildfire

Data analyzed for this hazard represents the incidents of wildfires per county from 1988 – 2004.

#### 5.7.1.1 Hazard Probability Scores for Wildfire Hazard Category

Many of the coastal and inner coastal counties in the state fall within the medium-high or high range for the wildfire hazard, with Berkeley and Williamsburg showing the highest wildfire probabilities within the state. In the midlands, Aiken, Lexington, and Orangeburg fall into the medium-high range. The top choropleth map in Figure 5.7 represents the Hazard Probability scores for the wildfire hazard.

#### 5.7.1.2 Social Vulnerability Scores

The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. The middle choropleth map in Figure 5.7 represents the Social Vulnerability scores for the state.

#### 5.7.1.3 Place Vulnerability Scores for Wildfire Hazard Category

Those counties that fall in the highest range for Place Vulnerability for the wildfire hazard are all located in the midlands or the coastal plain and include Berkeley, Charleston, Horry, Williamsburg, Florence, Orangeburg, and Lexington. These counties should place high priority on preparedness for this hazard. The bottom choropleth map in Figure 5.7 represents the Place Vulnerability scores for the wildfire hazard. Scores for the wildfire hazard category are in Table 5.5. This table ranks counties by Place Vulnerability scores for wildfire hazard.

### 5.7.2 Structural Fires

Data are not available at this time.

### 5.7.3 Recent Wildfire Activity

There have been nearly 16,000 wildfires since 2001 in South Carolina. These fires occurred in every county in the state and impacted roughly 104,000 acres of land. Twelve counties each had more than five hundred wildfires during this time period. These counties and their respective number of wildfires are: Williamsburg (1125), Berkeley (901), Florence (888), Orangeburg (866), Horry (748), Colleton (735), Lexington (688), Aiken (581), Clarendon (573), Jasper (559), and Darlington (522).

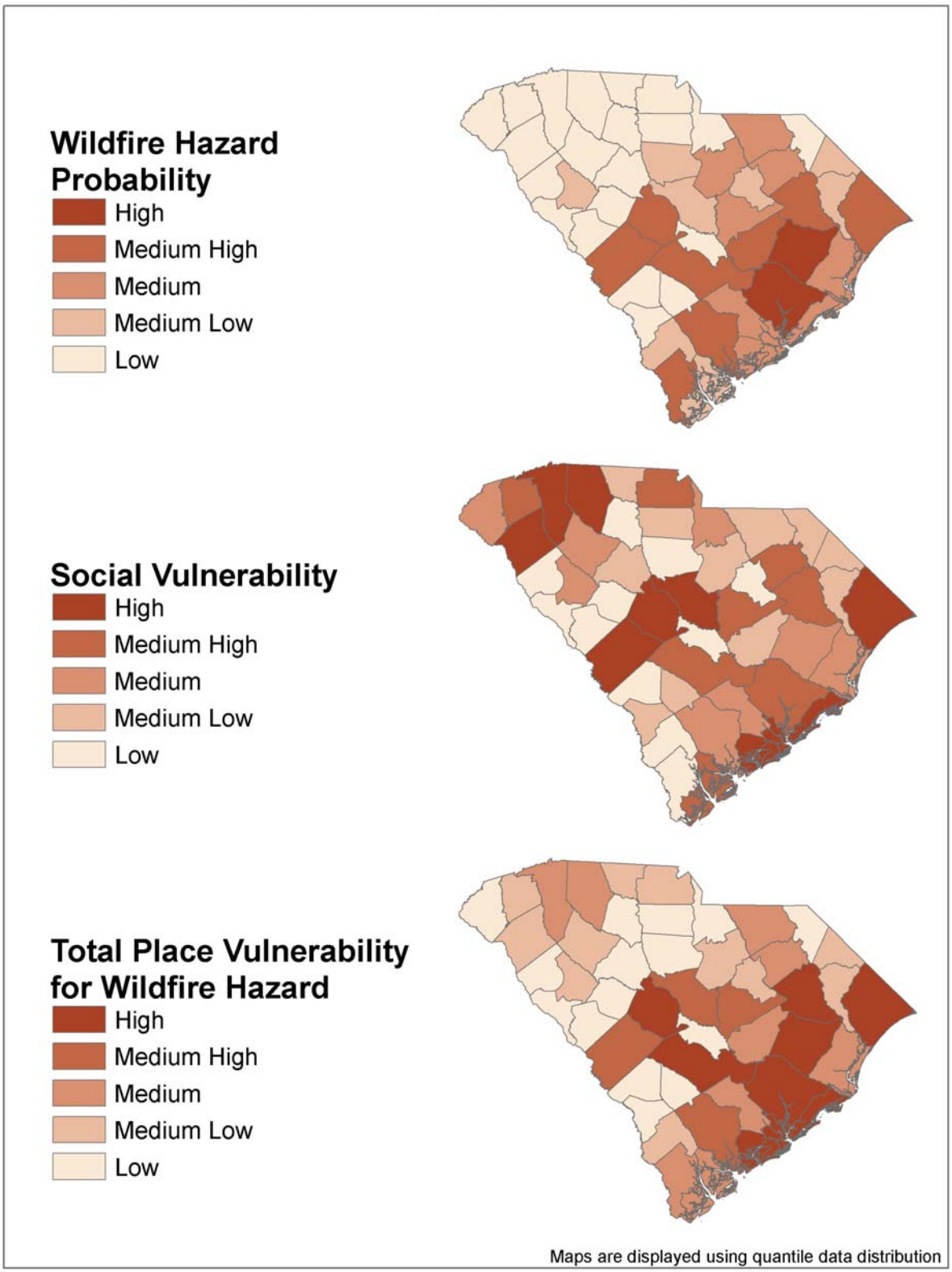


**Figure 5.7: Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability Scores for Wildfire Hazards**

**Table 5.5: Counties Ranked by Place Vulnerability for Wildfire**

| Rank | County | Probability of Occurrence | Social Vulnerability Score | Place Vulnerability Score |
|---|---|---|---|---|
| 1 | BERKELEY | 31894.12 | 2.93 | 93449.76 |
| 2 | LEXINGTON | 23347.06 | 3.86 | 90119.65 |
| 3 | HORRY | 18341.18 | 4.52 | 82902.12 |
| 4 | ORANGEBURG | 23323.53 | 2.81 | 65539.12 |
| 5 | FLORENCE | 20835.29 | 2.94 | 61255.76 |
| 6 | CHARLESTON | 10923.53 | 5.59 | 61062.53 |
| 7 | WILLIAMSBURG | 33517.65 | 1.80 | 60331.76 |
| 8 | AIKEN | 16905.88 | 3.10 | 52408.24 |
| 9 | RICHLAND | 8670.59 | 5.52 | 47861.65 |
| 10 | COLLETON | 22758.82 | 1.64 | 37324.47 |
| 11 | SUMTER | 13588.24 | 2.71 | 36824.12 |
| 12 | GREENVILLE | 4988.24 | 6.37 | 31775.06 |
| 13 | CLARENDON | 18376.47 | 1.56 | 28667.29 |
| 14 | SPARTANBURG | 5235.29 | 4.80 | 25129.41 |
| 15 | DARLINGTON | 12005.88 | 2.06 | 24732.12 |
| 16 | DORCHESTER | 13182.35 | 1.79 | 23596.41 |
| 17 | GEORGETOWN | 12605.88 | 1.68 | 21177.88 |
| 18 | CHESTERFIELD | 13376.47 | 1.58 | 21134.82 |
| 19 | JASPER | 17247.06 | 1.08 | 18626.82 |
| 20 | BEAUFORT | 7982.35 | 2.31 | 18439.24 |
| 21 | ANDERSON | 4676.47 | 3.41 | 15946.76 |
| 22 | KERSHAW | 11200.00 | 1.38 | 15456.00 |
| 23 | YORK | 4588.24 | 2.86 | 13122.35 |
| 24 | MARLBORO | 7935.29 | 1.58 | 12537.76 |
| 25 | PICKENS | 5535.29 | 2.25 | 12454.41 |
| 26 | GREENWOOD | 7429.41 | 1.65 | 12258.53 |
| 27 | LAURENS | 5458.82 | 2.00 | 10917.65 |
| 28 | HAMPTON | 9064.71 | 1.20 | 10877.65 |
| 29 | DILLON | 6764.71 | 1.48 | 10011.76 |
| 30 | LEE | 8400.00 | 1.19 | 9996.00 |
| 31 | CHEROKEE | 5947.06 | 1.58 | 9396.35 |
| 32 | FAIRFIELD | 6482.35 | 1.20 | 7778.82 |
| 33 | LANCASTER | 4600.00 | 1.61 | 7406.00 |
| 34 | OCONEE | 3958.82 | 1.73 | 6848.76 |
| 35 | BAMBERG | 5105.88 | 1.31 | 6688.71 |
| 36 | BARNWELL | 5035.29 | 1.21 | 6092.71 |
| 37 | CHESTER | 4517.65 | 1.29 | 5827.76 |
| 38 | ABBEVILLE | 5229.41 | 1.10 | 5752.35 |
| 39 | MCCORMICK | 3705.88 | 1.42 | 5262.35 |
| 40 | NEWBERRY | 4129.41 | 1.24 | 5120.47 |
| 41 | UNION | 3964.71 | 1.21 | 4797.29 |
| 42 | CALHOUN | 4600.00 | 0.88 | 4048.00 |
| 43 | ALLENDALE | 3200.00 | 1.25 | 4000.00 |
| 44 | MARION | 4735.29 | 0.78 | 3693.53 |
| 45 | SALUDA | 3711.76 | 0.86 | 3192.12 |
| 46 | EDGEFIELD | 3464.71 | 0.92 | 3187.53 |

## 5.8 HAZMAT Incidents from Fixed Facility and Transportation Accidents

Data analyzed represent the number of hazardous materials spills reported to the national Emergency Response Notification System (ERNS). These spills include those from fixed facilities and transportation sources by county between 1987-2005.

### 5.8.1 Hazard Probability Scores for HAZMAT Hazard Category

Charleston County was the only county with the frequency of occurrence score in the highest category. Charleston County had a reported 2,309 spills in nineteen years, or 28% of the state's total. Second to Charleston was Greenville County with 439 reported HAZMAT spills during 1987-2005, followed by Spartanburg (419), and Berkeley (388). The top choropleth map in Figure 5.8 represents the Hazard Probability scores for the HAZMAT hazard category.

### 5.8.2 Social Vulnerability Scores

The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. The middle choropleth map in Figure 5.8 represents the Social Vulnerability scores for the state.

### 5.8.3 Place Vulnerability Scores for HAZMAT Hazard Category

Charleston County was also the only county with a Place Vulnerability Score in the highest range. High priority should be given to this hazard within Charleston County. The bottom choropleth map in Figure 5.8 represents the Place Vulnerability scores for the HAZMAT hazard category. Scores for the HAZMAT hazard are in Table 5.6.

**Note:** Locations of interstates, railways, airports (commercial and military), and marine ports throughout the state are shown in Figure 5.9.

### 5.8.4 Recent HAZMAT Activity

There have been 1,464 reported HAZMAT incidents in South Carolina since 2001. Two counties have had more than one hundred HAZMAT release incidents during this time period: Charleston (433) and Beaufort (109). Most of the HAZMAT releases were from fixed facilities (476), followed by stationary vessels (265), highway accidents (200) and railroad releases (200).

The most significant of these release events was the Graniteville train derailment and subsequent chlorine release that occurred on January 6, 2005. This event occurred when a Norfolk Southern freight train with 42 cars struck a train with one locomotive and two cars at an Avondale Mills textile facility at about 2:40 a.m. A total of sixteen cars derailed, three of which were carrying ninety tons of chlorine each. One of the derailed tanker cars ruptured and leaked chlorine gas for most of the day. This incident caused nine fatalities, 250 people were treated at local hospitals, and a mandatory evacuation forced the displacement of about 5400 of the areas' 7000 residents. A complete report on the accident and an evaluation of the evacuation can be found in Mitchell et al., 2005.

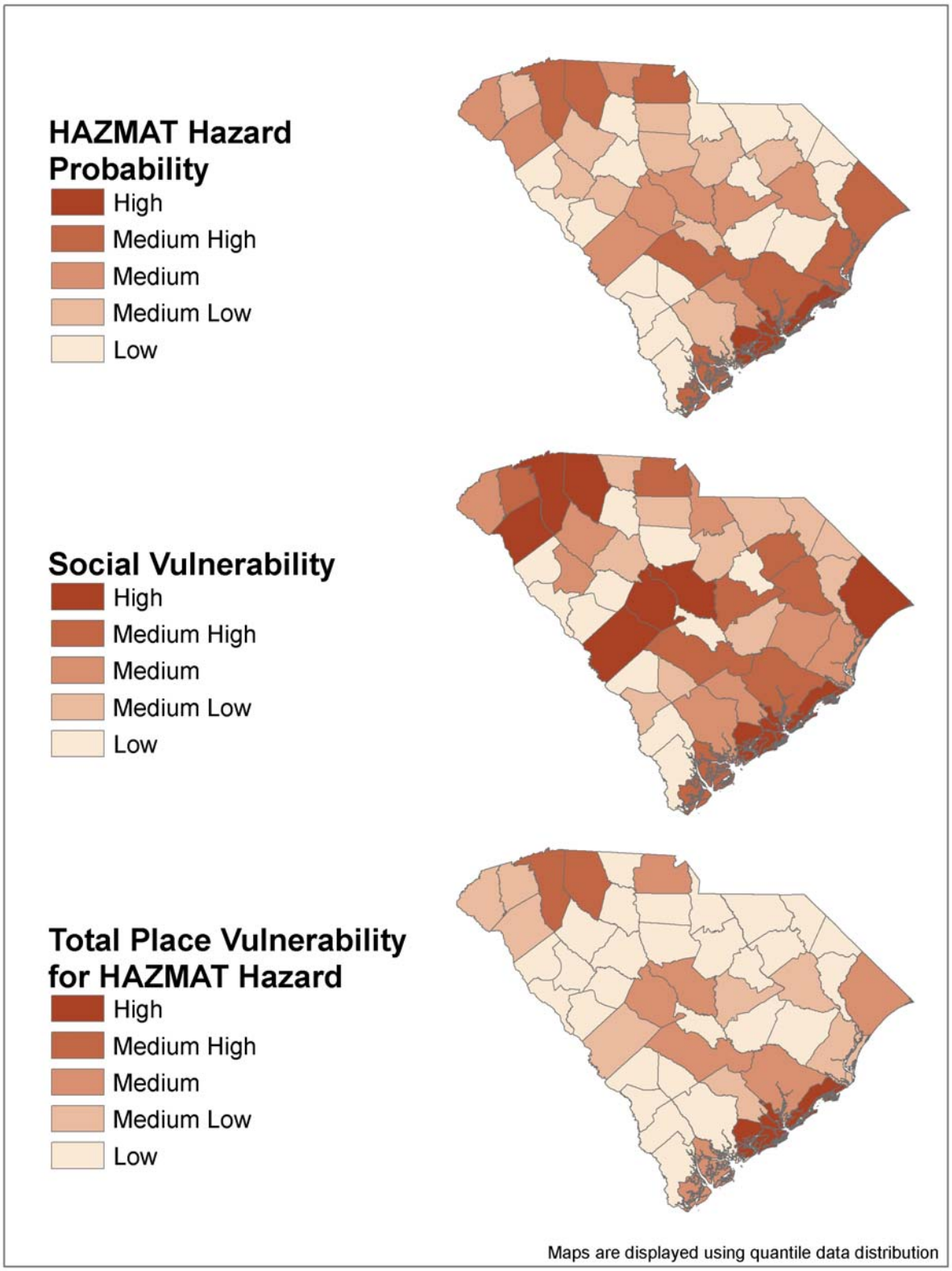


**Figure 5.8: Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability Scores for HAZMAT Hazards**

## Table 5.6: Counties Ranked by Place Vulnerability for HAZMAT

| Rank | County | Probability of Occurrence | Social Vulnerability Score | Place Vulnerability Score |
|---|---|---|---|---|
| 1 | CHARLESTON | 12152.63 | 5.59 | 67933.21 |
| 2 | GREENVILLE | 2310.53 | 6.37 | 14718.05 |
| 3 | SPARTANBURG | 2205.26 | 4.80 | 10585.26 |
| 4 | HORRY | 1815.79 | 4.52 | 8207.37 |
| 5 | RICHLAND | 1136.84 | 5.52 | 6275.37 |
| 6 | BERKELEY | 2042.11 | 2.93 | 5983.37 |
| 7 | ORANGEBURG | 1894.74 | 2.81 | 5324.21 |
| 8 | YORK | 1736.84 | 2.86 | 4967.37 |
| 9 | LEXINGTON | 1284.21 | 3.86 | 4957.05 |
| 10 | BEAUFORT | 1915.79 | 2.31 | 4425.47 |
| 11 | ANDERSON | 842.11 | 3.41 | 2871.58 |
| 12 | AIKEN | 868.42 | 3.10 | 2692.11 |
| 13 | GEORGETOWN | 1568.42 | 1.68 | 2634.95 |
| 14 | FLORENCE | 842.11 | 2.94 | 2475.79 |
| 15 | SUMTER | 710.53 | 2.71 | 1925.53 |
| 16 | OCONEE | 873.68 | 1.73 | 1511.47 |
| 17 | DORCHESTER | 815.79 | 1.79 | 1460.26 |
| 18 | PICKENS | 642.11 | 2.25 | 1444.74 |
| 19 | CHEROKEE | 752.63 | 1.58 | 1189.16 |
| 20 | DARLINGTON | 510.53 | 2.06 | 1051.68 |
| 21 | KERSHAW | 647.37 | 1.38 | 893.37 |
| 22 | GREENWOOD | 515.79 | 1.65 | 851.05 |
| 23 | LAURENS | 415.79 | 2.00 | 831.58 |
| 24 | COLLETON | 431.58 | 1.64 | 707.79 |
| 25 | CHESTER | 463.16 | 1.29 | 597.47 |
| 26 | FAIRFIELD | 357.89 | 1.20 | 429.47 |
| 27 | SALUDA | 421.05 | 0.86 | 362.11 |
| 28 | DILLON | 242.11 | 1.48 | 358.32 |
| 29 | CHESTERFIELD | 226.32 | 1.58 | 357.58 |
| 30 | LEE | 294.74 | 1.19 | 350.74 |
| 31 | NEWBERRY | 268.42 | 1.24 | 332.84 |
| 32 | CALHOUN | 368.42 | 0.88 | 324.21 |
| 33 | MCCORMICK | 215.79 | 1.42 | 306.42 |
| 34 | LANCASTER | 189.47 | 1.61 | 305.05 |
| 35 | JASPER | 257.89 | 1.08 | 278.53 |
| 36 | WILLIAMSBURG | 152.63 | 1.80 | 274.74 |
| 37 | BARNWELL | 215.79 | 1.21 | 261.11 |
| 38 | CLARENDON | 152.63 | 1.56 | 238.11 |
| 39 | HAMPTON | 194.74 | 1.20 | 233.68 |
| 40 | MARLBORO | 121.05 | 1.58 | 191.26 |
| 41 | UNION | 157.89 | 1.21 | 191.05 |
| 42 | ALLENDALE | 152.63 | 1.25 | 190.79 |
| 43 | BAMBERG | 142.11 | 1.31 | 186.16 |
| 44 | EDGEFIELD | 189.47 | 0.92 | 174.32 |
| 45 | ABBEVILLE | 100.00 | 1.10 | 110.00 |
| 46 | MARION | 121.05 | 0.78 | 94.42 |

## 5.9 Terrorism

Not reported here. Contact SCEMD for information regarding terrorism. The only reported incident was the October 15, 2003 ricin-laced letter addressed to the U.S. Department of Transportation in Washington D.C., which was intercepted at the Greenville, SC mail sorting facility. No one was injured.

## 5.10 Transportation Accidents

Data analyzed for this hazard represents the incidents of transportation accidents from 1999 – 2004. Additionally, the locations of interstates, railways, airports (commercial and military), and marine ports throughout the state are shown in Figure 5.9. Data analyzed represent the number of motor vehicle transportation accidents reported to the South Carolina Department of Public Safety's Office of Highway Safety. The Statistics Section within this office maintains the South Carolina traffic collision database and is the core of data analysis within the Office of Highway Safety. Two publications are made available each year and are disseminated throughout the state, the South Carolina Traffic Collision Fact Book and the South Carolina Commercial Motor Vehicle Traffic Collision Fact Book. This accident information includes data from numerous transportation sources by county between 1999-2004.

### 5.10.1 Hazard Probability Scores for Transportation Accidents

As expected, the most populated counties within the state have the highest probability of a transportation accident. Additionally, the presence of interstate junctions such as I-26/I-85 in the upstate and I-20/I-26 in Columbia Metropolitan Area are correlated with higher numbers of transportation accidents. The counties that fall into the highest level of transportation accident probability are Greenville in the upstate, Richland in the midlands, and Charleston in the low country. The top choropleth map in Figure 5.10 shows the hazard probability ranks for South Carolina counties.

### 5.10.2 Social Vulnerability Scores

The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. The middle choropleth map in Figure 5.10 represents the Social Vulnerability scores for the state.

### 5.10.3 Place Vulnerability Scores for Transportation Accidents Category

Charleston, Richland, and Greenville Counties are also the only counties with Place Vulnerability Scores in the highest range. High priority should be given to this hazard within these three counties. The bottom choropleth map in Figure 5.10 represents the Place Vulnerability scores for the transportation accident hazard category. Scores for Transportation hazards are in Table 5.7.

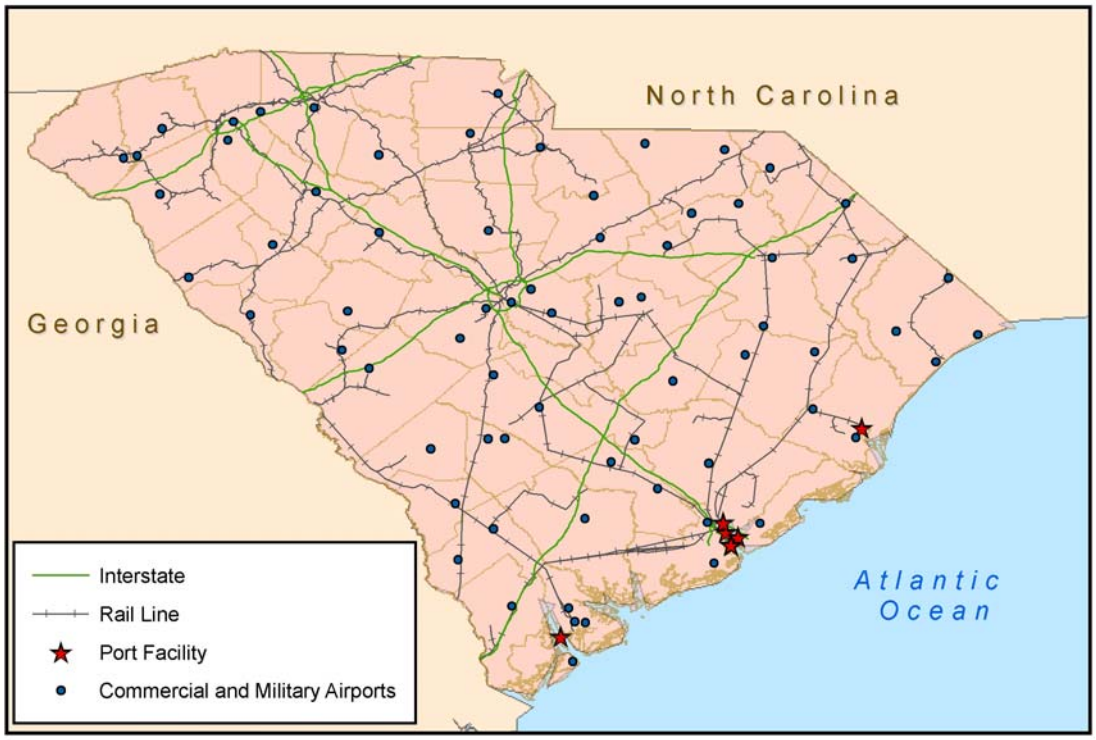


**Figure 5.9: South Carolina Commercial and Military Airports, Marine Ports, Railroads, and Interstates**

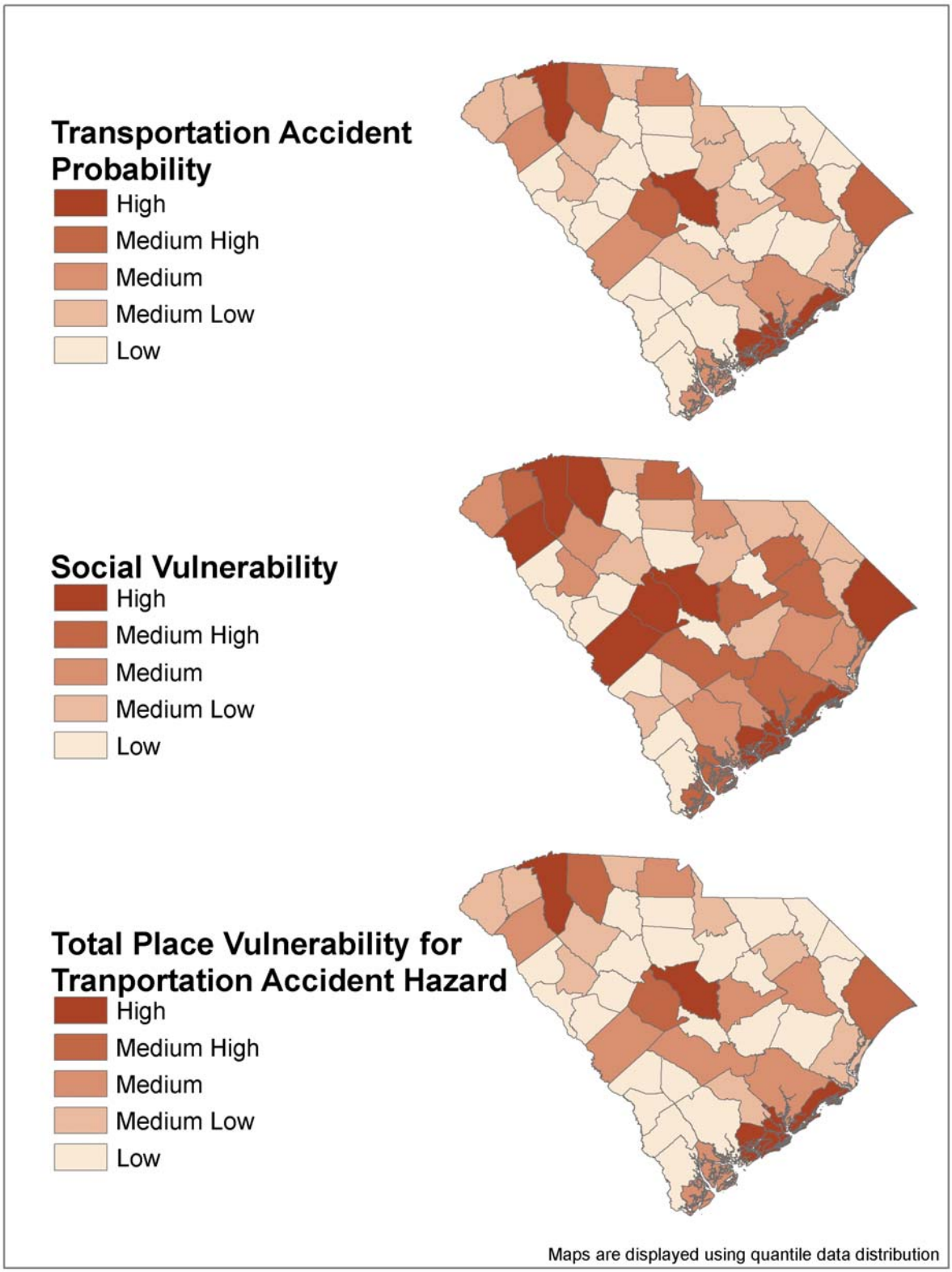


**Figure 5.10: Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability Scores for Transportation Accident Hazards**

**Table 5.7: Counties Ranked by Place Vulnerability for Transportation Accidents**

| Rank | County | Probability of Occurrence | Social Vulnerability Score | Place Vulnerability Score |
|---|---|---|---|---|
| 1 | GREENVILLE | 1087950.00 | 6.37 | 52494.51 |
| 2 | CHARLESTON | 1156600.00 | 5.59 | 132989.45 |
| 3 | RICHLAND | 1015783.33 | 5.52 | 57103.76 |
| 4 | HORRY | 760566.67 | 4.52 | 93931.67 |
| 5 | SPARTANBURG | 656550.00 | 4.80 | 39943.03 |
| 6 | LEXINGTON | 561600.00 | 3.86 | 96913.49 |
| 7 | ANDERSON | 403150.00 | 3.41 | 21273.60 |
| 8 | FLORENCE | 407083.33 | 2.94 | 65146.52 |
| 9 | YORK | 414183.33 | 2.86 | 20012.95 |
| 10 | AIKEN | 317483.33 | 3.10 | 56694.69 |
| 11 | BERKELEY | 284883.33 | 2.93 | 101715.73 |
| 12 | BEAUFORT | 293383.33 | 2.31 | 24233.76 |
| 13 | ORANGEBURG | 238516.67 | 2.81 | 72343.16 |
| 14 | SUMTER | 236983.33 | 2.71 | 39946.05 |
| 15 | PICKENS | 200483.33 | 2.25 | 15575.32 |
| 16 | DORCHESTER | 221383.33 | 1.79 | 26133.08 |
| 17 | LAURENS | 157516.67 | 2.00 | 12991.62 |
| 18 | DARLINGTON | 148800.00 | 2.06 | 26633.91 |
| 19 | GREENWOOD | 162900.00 | 1.65 | 14117.33 |
| 20 | CHEROKEE | 144816.67 | 1.58 | 11614.00 |
| 21 | OCONEE | 131783.33 | 1.73 | 9589.54 |
| 22 | LANCASTER | 138533.33 | 1.61 | 8585.66 |
| 23 | GEORGETOWN | 125383.33 | 1.68 | 24684.91 |
| 24 | COLLETON | 101683.33 | 1.64 | 38917.92 |
| 25 | KERSHAW | 116350.00 | 1.38 | 17116.26 |
| 26 | DILLON | 94400.00 | 1.48 | 10961.60 |
| 27 | WILLIAMSBURG | 74233.33 | 1.80 | 61320.22 |
| 28 | CHESTERFIELD | 77083.33 | 1.58 | 22167.02 |
| 29 | CLARENDON | 69016.67 | 1.56 | 29608.50 |
| 30 | NEWBERRY | 86400.00 | 1.24 | 6095.21 |
| 31 | CHESTER | 75833.33 | 1.29 | 7233.77 |
| 32 | MARLBORO | 61066.67 | 1.58 | 13388.11 |
| 33 | JASPER | 84333.33 | 1.08 | 19470.63 |
| 34 | UNION | 55933.33 | 1.21 | 5760.91 |
| 35 | FAIRFIELD | 52800.00 | 1.20 | 9057.48 |
| 36 | MARION | 77400.00 | 0.78 | 4089.56 |
| 37 | LEE | 36933.33 | 1.19 | 10840.74 |
| 38 | HAMPTON | 34966.67 | 1.20 | 11703.51 |
| 39 | BARNWELL | 34133.33 | 1.21 | 6915.40 |
| 40 | ABBEVILLE | 35066.67 | 1.10 | 6499.34 |
| 41 | EDGEFIELD | 40916.67 | 0.92 | 3779.08 |
| 42 | BAMBERG | 24483.33 | 1.31 | 7476.79 |
| 43 | CALHOUN | 36066.67 | 0.88 | 4753.27 |
| 44 | SALUDA | 34366.67 | 0.86 | 3952.59 |
| 45 | MCCORMICK | 16583.33 | 1.42 | 6272.48 |
| 46 | ALLENDALE | 14416.67 | 1.25 | 4812.67 |

## 5.11 Civil Disorder

No available data.

## 5.12 Dam Failures

There were no incident data to report. However, notice the counties that house a number of significant-hazard and high-hazard ratings based on the Department of Health and Environmental Control's (DHEC) assessment of state regulated dams (Figure 5.11). Greenville, Spartanburg, Richland, Aiken, Orangeburg, Edgefield, Lexington, and Chesterfield have high numbers of significant and high rated dams. Many of these counties also have Social Vulnerability scores in the highest category. For these counties, high priority should be on preparation for this hazard category.

The state also has Federal Energy Regulatory Commission (FERC) regulated dams (Figure 5.12). These dams facilitate hydroelectric power production and are generally larger than the DHEC-regulated dams. Pickens County has the largest number of high-hazard rated FERC dams. Additionally, Abbeville, Oconee, and Spartanburg Counties each have one significant rated FERC dam located within them. First priority should be on preparation for this hazard on these counties, followed by Pickens County. It should be noted that of the 34 FERC-regulated dams in the State Emergency Response Plan, five had no ratings or specific locations and are thus excluded from this analysis.

Using data from the National Inventory of Dams shows a moderately different picture of significant and high rated dams. It is interesting to note the differences between a national dataset of dams and a dataset put together and monitored by the state. Although many of the dams can be found in both datasets, there is a difference of 117 dams between the state and national datasets. Figure 5.13 displays the number of low, significant, and high rated dams according to the National Inventory of Dams.

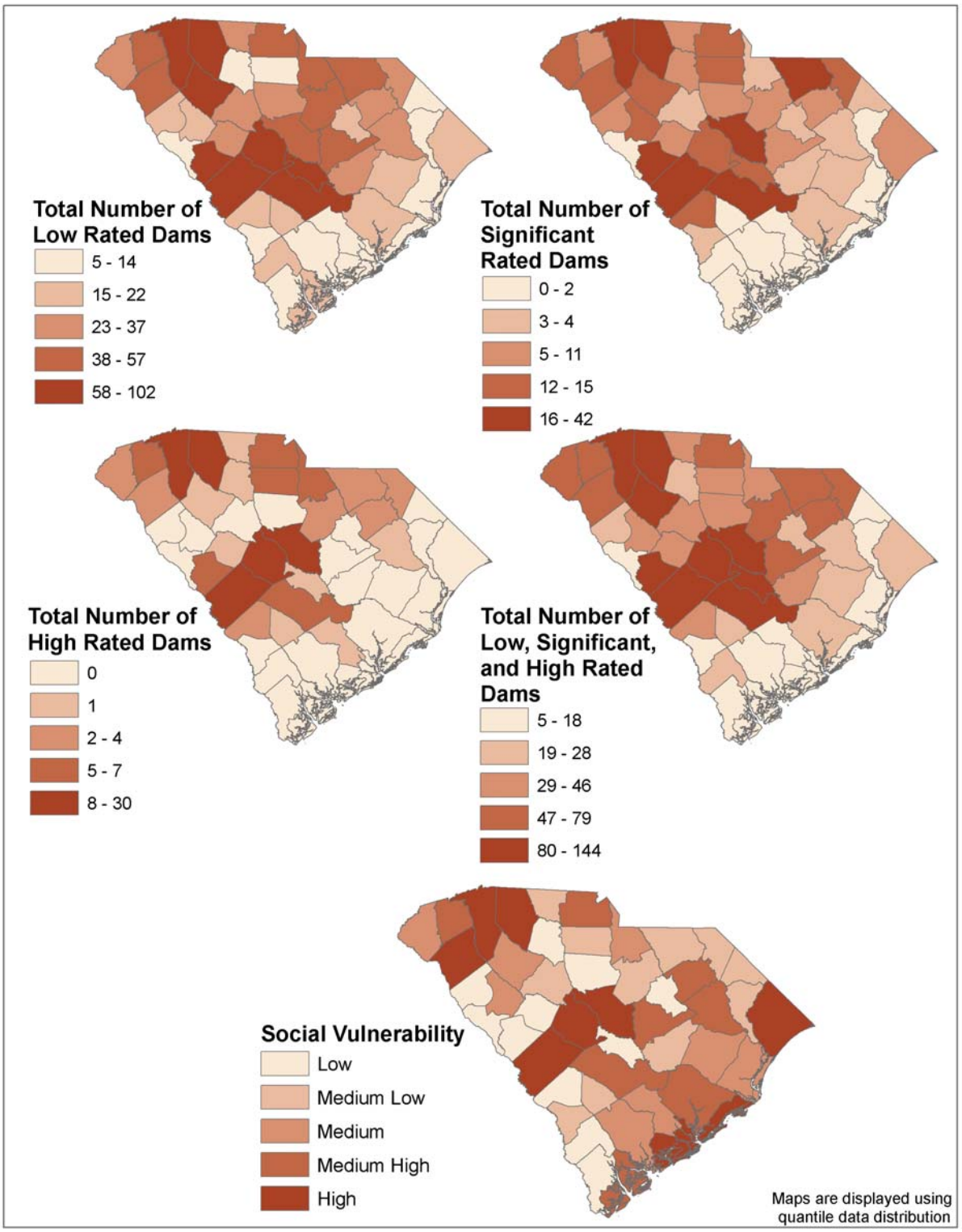


**Figure 5.11: DHEC Regulated Dams (Rated Low, Significant, or High Hazard) and Social Vulnerability Scores**

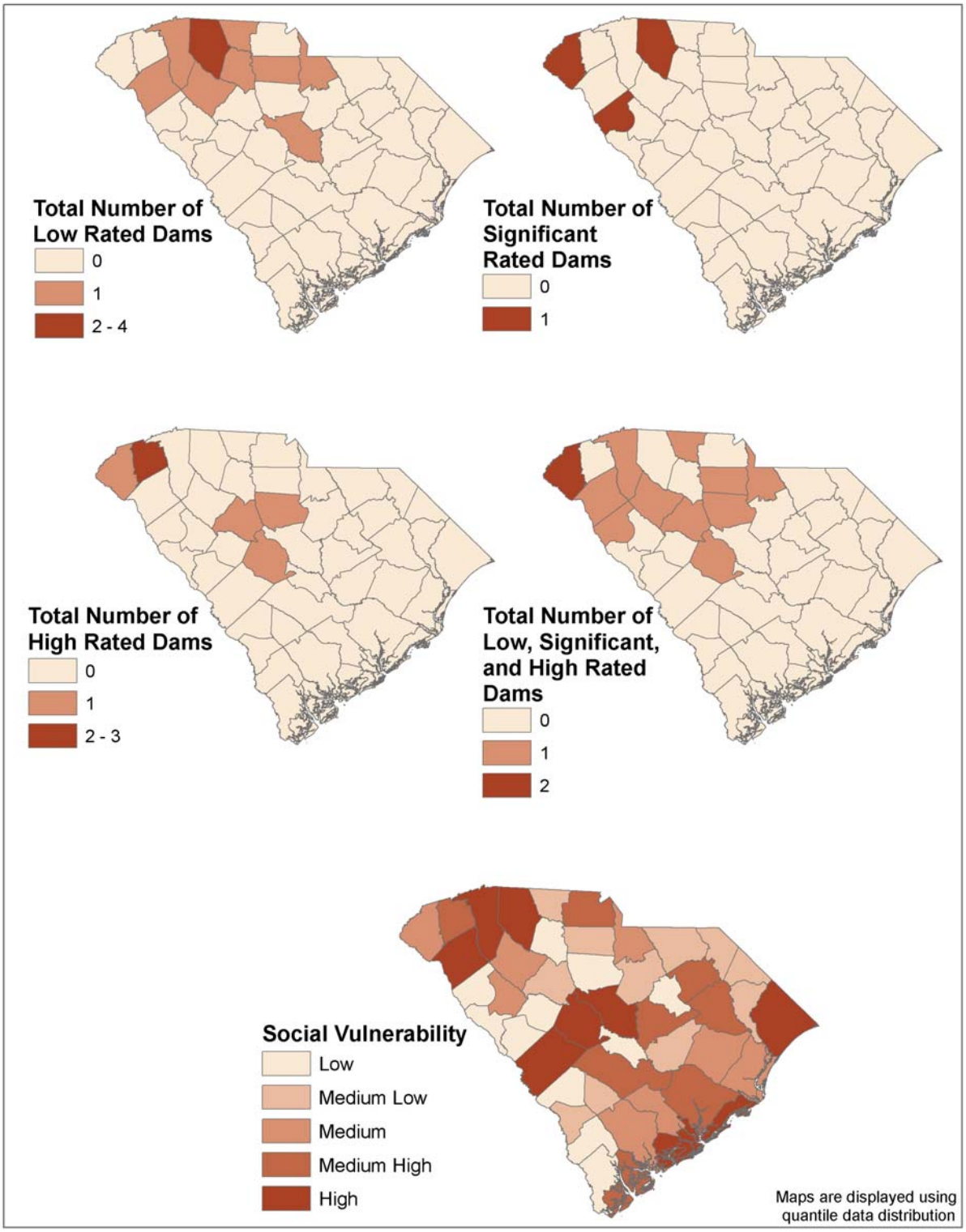


**Figure 5.12: Federal Energy Regulatory Commission Dams (Rated Low, Significant, or High Hazard) and Social Vulnerability Scores**

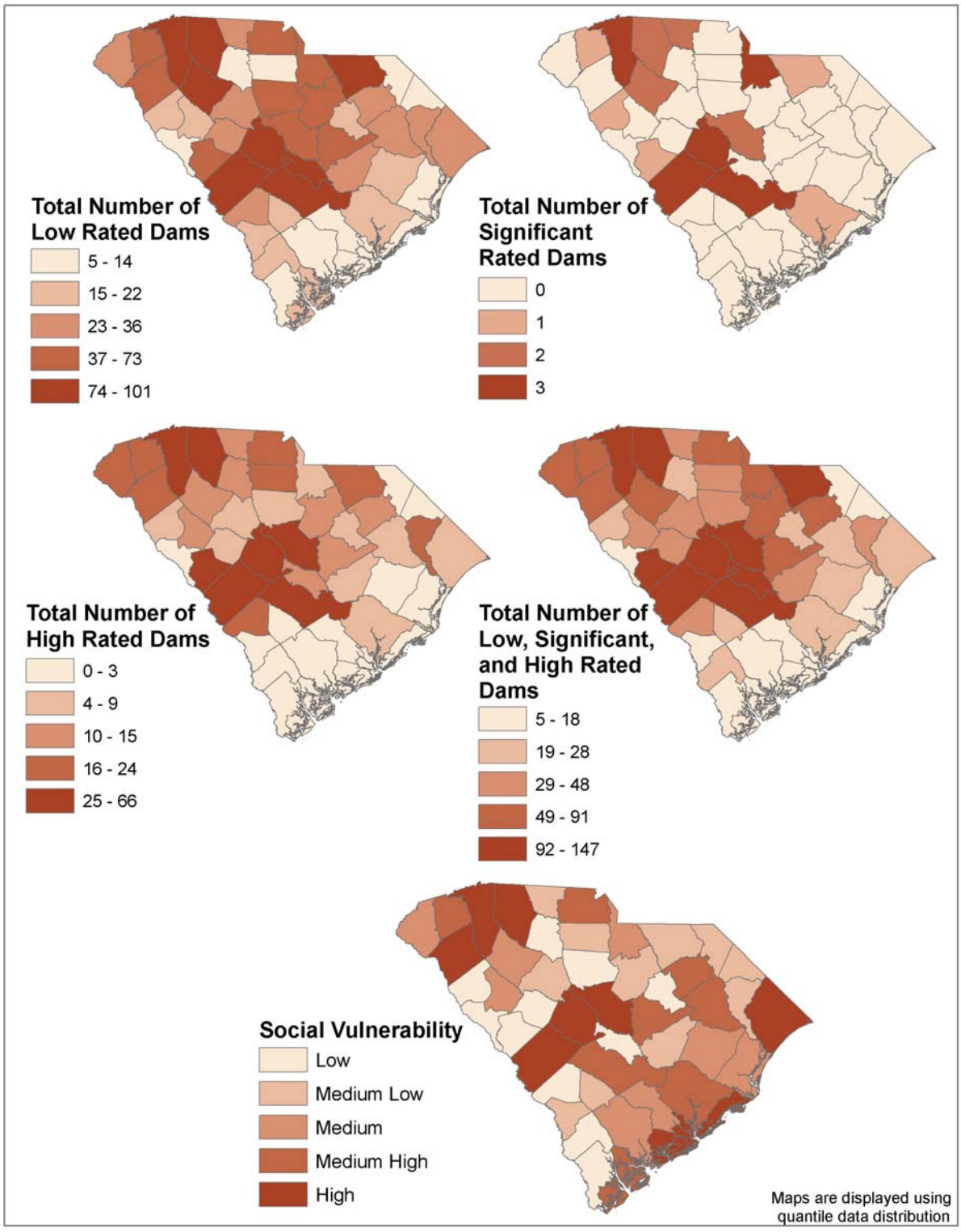


**Figure 5.13: National Inventory of Dams Regulated Dams (Rated Low, Significant, or High Hazard) and Social Vulnerability Scores**

## 5.13 Winter Storms

Data analyzed for the winter storm hazard represents a compilation of reported ice, sleet, and snow events per county from 1950 – 2005.

### 5.13.1 Hazard Probability Scores for Winter Storm Hazard Category

As expected, a line of counties from Oconee to York in the northernmost portion of the state fell into the highest category of Hazard Probability. Oconee had the highest number of reported events (57), with Greenville and Spartanburg Counties tied for second most hazardous at 55 reported events each. The top choropleth map in Figure 5.14 represents the Hazard Probability scores for the winter storm hazard.

### 5.13.2 Social Vulnerability Scores

The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. The middle choropleth map in Figure 5.14 represents the Social Vulnerability scores for the state.

### 5.13.3 Place Vulnerability Scores for Winter Storm Hazard Category

Counties with the highest Place Vulnerability scores for the winter storm hazard are Greenville and Spartanburg. Notice the moderate levels of vulnerability in Richland, Charleston, Florence, and Horry Counties. While Greenville and Spartanburg have an obvious higher level of concern for winter storm hazard preparation, these counties should also consider a winter storm a priority. For example, the 2000 winter storm resulted in a Presidential Disaster Declaration for 38 of South Carolina's 46 counties including Georgetown and Charleston counties.

The bottom choropleth map in Figure 5.14 represents the Place Vulnerability scores for the winter storm hazard. Scores for the winter storm hazard category are in Table 5.8. This table also ranks counties by Place Vulnerability scores.

### 5.13.4 Recent Winter Storm Activity

There have been four severe winter events in South Carolina since 2001. These winter storms account for two fatalities, twenty-four injuries and $129.8 million in property damage (NCDC Storm Data Online, 2006). A December 4, 2002 ice storm causing $100 million in property damages affected a majority of the counties in the state. Abbeville, Anderson, Cherokee, Chester, Greenville, Oconee, Pickens, Greenwood, Laurens, Spartanburg, Union, and York Counties suffered most of the losses from this event, which included ice accumulations up to 1½ inch in some areas. Hundreds of thousands of homes were without power, many for as long as two weeks in some areas.

A severe winter storm on January 25-27, 2004 affected all but five counties statewide with ice and snow. Damages to property primarily in the Pee Dee region--Darlington, Dillon, Florence, Marion, Marlboro, and Williamsburg Counties—were estimated at over $26 million (NCDC Storm Data Online, 2006). Major power outages

occurred due to falling limbs and many homes were without power for a week. This incident prompted the first forest disaster declaration in two years.

A late February 2004 winter mix affecting all of the Upstate counties and those in the northern piedmont of the state caused one fatality and almost $2 million in property damages. Total snowfall accumulation was up to 22 inches in some areas and caused one fatal vehicle accident in which thousands of people became stranded on I-77.

Most recently, a mid-December 2005 winter storm producing ice and snow in the upstate counties of Abbeville, Anderson, Cherokee, Chester, Greenville, Laurens, Oconee, Pickens, Spartanburg, Union, and York. This event caused almost $1.5 million in property damage due to power outages and housing unit damage from falling limbs and trees. There were four (indirect) fatalities associated with carbon monoxide poisoning due to indoor generator use in Anderson.

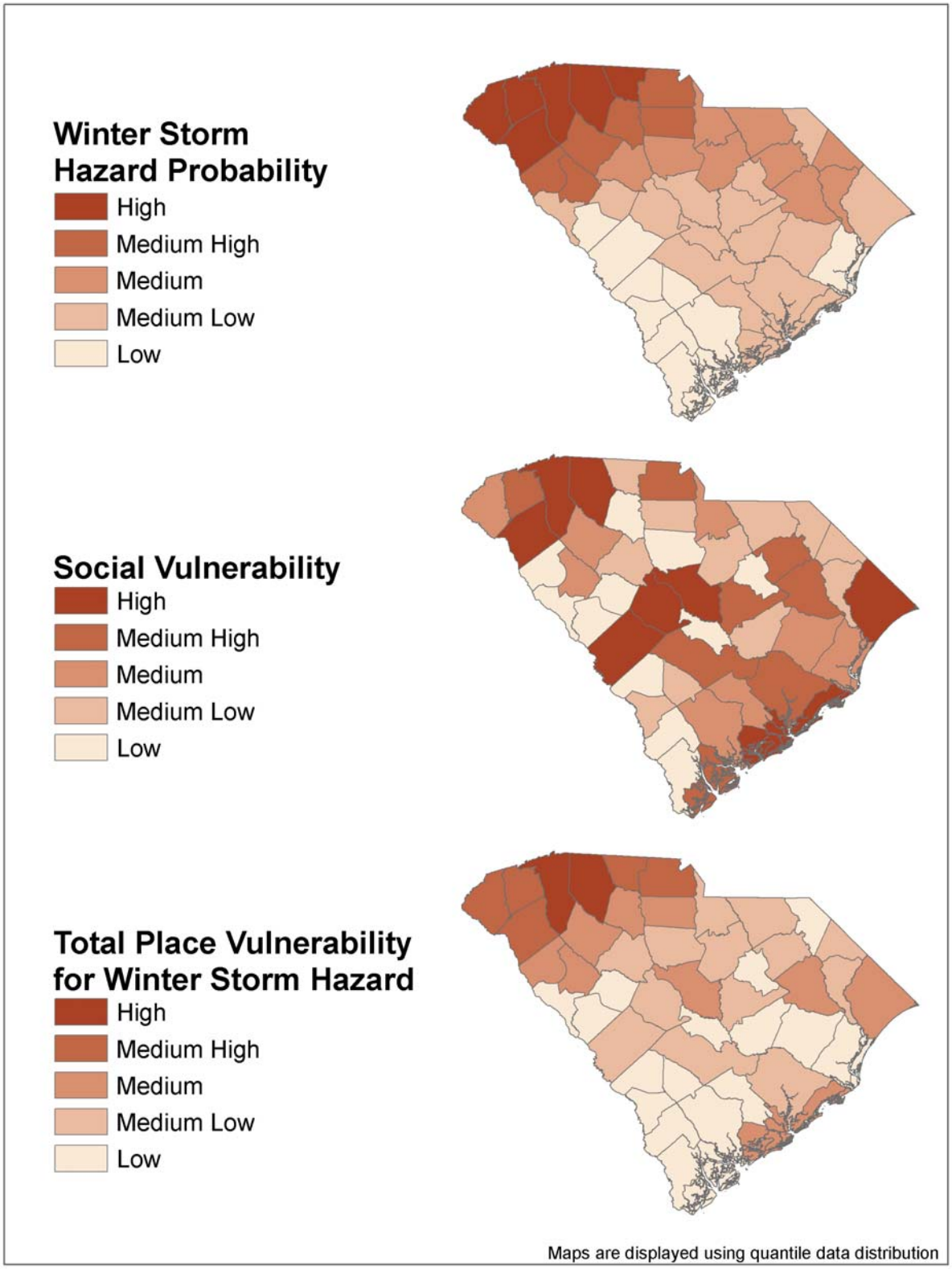


**Figure 5.14: Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability Scores for Winter Storm Hazards**

**Table 5.8: Counties Ranked by Place Vulnerability for Winter Storm**

| Rank | County | Probability of Occurrence | Social Vulnerability Score | Place Vulnerability Score |
|---|---|---|---|---|
| 1 | GREENVILLE | 98.21 | 6.37 | 625.63 |
| 2 | SPARTANBURG | 98.21 | 4.80 | 471.43 |
| 3 | ANDERSON | 75.00 | 3.41 | 255.75 |
| 4 | PICKENS | 91.07 | 2.25 | 204.91 |
| 5 | OCONEE | 101.79 | 1.73 | 176.09 |
| 6 | YORK | 57.14 | 2.86 | 163.43 |
| 7 | CHEROKEE | 85.71 | 1.58 | 135.43 |
| 8 | LAURENS | 50.00 | 2.00 | 100.00 |
| 9 | CHESTER | 58.93 | 1.29 | 76.02 |
| 10 | GREENWOOD | 41.07 | 1.65 | 67.77 |
| 11 | RICHLAND | 10.71 | 5.52 | 59.14 |
| 12 | UNION | 48.21 | 1.21 | 58.34 |
| 13 | ABBEVILLE | 46.43 | 1.10 | 51.07 |
| 14 | CHARLESTON | 8.93 | 5.59 | 49.91 |
| 15 | HORRY | 10.71 | 4.52 | 48.43 |
| 16 | FLORENCE | 16.07 | 2.94 | 47.25 |
| 17 | DARLINGTON | 21.43 | 2.06 | 44.14 |
| 18 | MARLBORO | 26.79 | 1.58 | 42.32 |
| 19 | LEXINGTON | 10.71 | 3.86 | 41.36 |
| 20 | LANCASTER | 21.43 | 1.61 | 34.50 |
| 21 | CHESTERFIELD | 21.43 | 1.58 | 33.86 |
| 22 | DILLON | 19.64 | 1.48 | 29.07 |
| 23 | SUMTER | 10.71 | 2.71 | 29.04 |
| 24 | KERSHAW | 19.64 | 1.38 | 27.11 |
| 25 | BERKELEY | 8.93 | 2.93 | 26.16 |
| 26 | ORANGEBURG | 8.93 | 2.81 | 25.09 |
| 27 | AIKEN | 7.14 | 3.10 | 22.14 |
| 28 | NEWBERRY | 17.86 | 1.24 | 22.14 |
| 29 | FAIRFIELD | 17.86 | 1.20 | 21.43 |
| 30 | WILLIAMSBURG | 10.71 | 1.80 | 19.29 |
| 31 | MCCORMICK | 12.50 | 1.42 | 17.75 |
| 32 | DORCHESTER | 8.93 | 1.79 | 15.98 |
| 33 | CLARENDON | 8.93 | 1.56 | 13.93 |
| 34 | LEE | 10.71 | 1.19 | 12.75 |
| 35 | GEORGETOWN | 7.14 | 1.68 | 12.00 |
| 36 | MARION | 12.50 | 0.78 | 9.75 |
| 37 | BAMBERG | 7.14 | 1.31 | 9.36 |
| 38 | SALUDA | 10.71 | 0.86 | 9.21 |
| 39 | ALLENDALE | 7.14 | 1.25 | 8.93 |
| 40 | BARNWELL | 7.14 | 1.21 | 8.64 |
| 41 | BEAUFORT | 3.57 | 2.31 | 8.25 |
| 42 | CALHOUN | 8.93 | 0.88 | 7.86 |
| 43 | EDGEFIELD | 7.14 | 0.92 | 6.57 |
| 44 | HAMPTON | 5.36 | 1.20 | 6.43 |
| 45 | JASPER | 3.57 | 1.08 | 3.86 |
| 46 | COLLETON | 0.00 | 1.64 | 0.00 |

## 5.14 Drought

Data for the drought hazard represent moderate to severe drought as defined by the Palmer Drought Severity Index (PDSI). The PDSI is just one measurement of the severity of drought conditions based on water supply and demand (Cutter et al. 1999). The South Carolina Department of Natural Resources (SCDNR) Office of Climatology documents drought hazard data by month and by climate division. Data for each month are treated as a separate event. For example, if a region experienced eleven out of twelve months of drought in a given year, this assessment considered each month as a separate event for that year.

The state is divided into seven climate divisions (Figure 5.15). The PDSI reports one number each month for the entire climate division. Consequently, this report had to assign that number to all counties within the division. Notice the three counties in the upstate (Oconee, Pickens, and Greenville) that are split between the Mountain region and the Northwest region. Because all hazards in this statewide assessment are analyzed at the county level, this report averaged the number of drought events over both regions and assigned that number to each of those counties. Data here represent drought events reported from 1950 – 2005.

### 5.14.1 Hazard Probability Scores for Drought Hazard Category

York and Chester Counties fell in the highest category of Drought Hazard Probability, followed by the remainder of the northern and northwestern counties. This pattern is reflective of the larger defined drought region. The top choropleth map in Figure 5.16 represents the Hazard Probability scores for the drought hazard.

### 5.14.2 Social Vulnerability Scores

The highest Social Vulnerability scores were in Aiken, Anderson, Charleston, Greenville, Horry, Lexington, Richland, and Spartanburg Counties. The middle choropleth map in Figure 5.14 represents the Social Vulnerability scores for the state.

### 5.14.3 Place Vulnerability Scores for Drought Hazard Category

Greenville, Spartanburg, Richland, and Charleston counties fell in the highest category for Place Vulnerability scores for the drought hazard. These counties should place a priority on the preparation for this hazard. The bottom choropleth map in Figure 5.16 represents the Place Vulnerability scores for the drought hazard. Individual county Place Vulnerability Scores for the drought are in Table 5.9. This table also ranks counties by Place Vulnerability Scores.

### 5.14.4 Recent Drought Activity

There were twenty-four drought events in South Carolina since 2001. No fatalities, injuries, property, or crop damage were associated with these mild to moderate drought events.

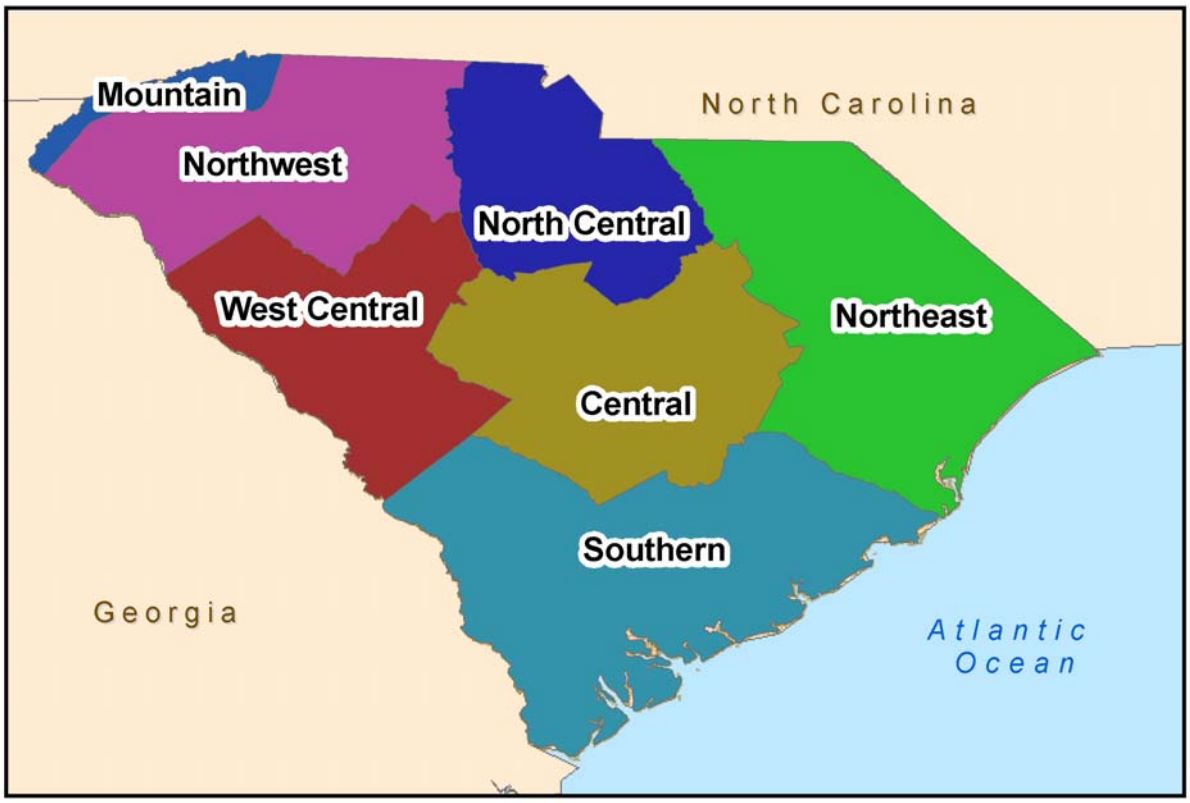


**Figure 5.15: South Carolina Climate Divisions**

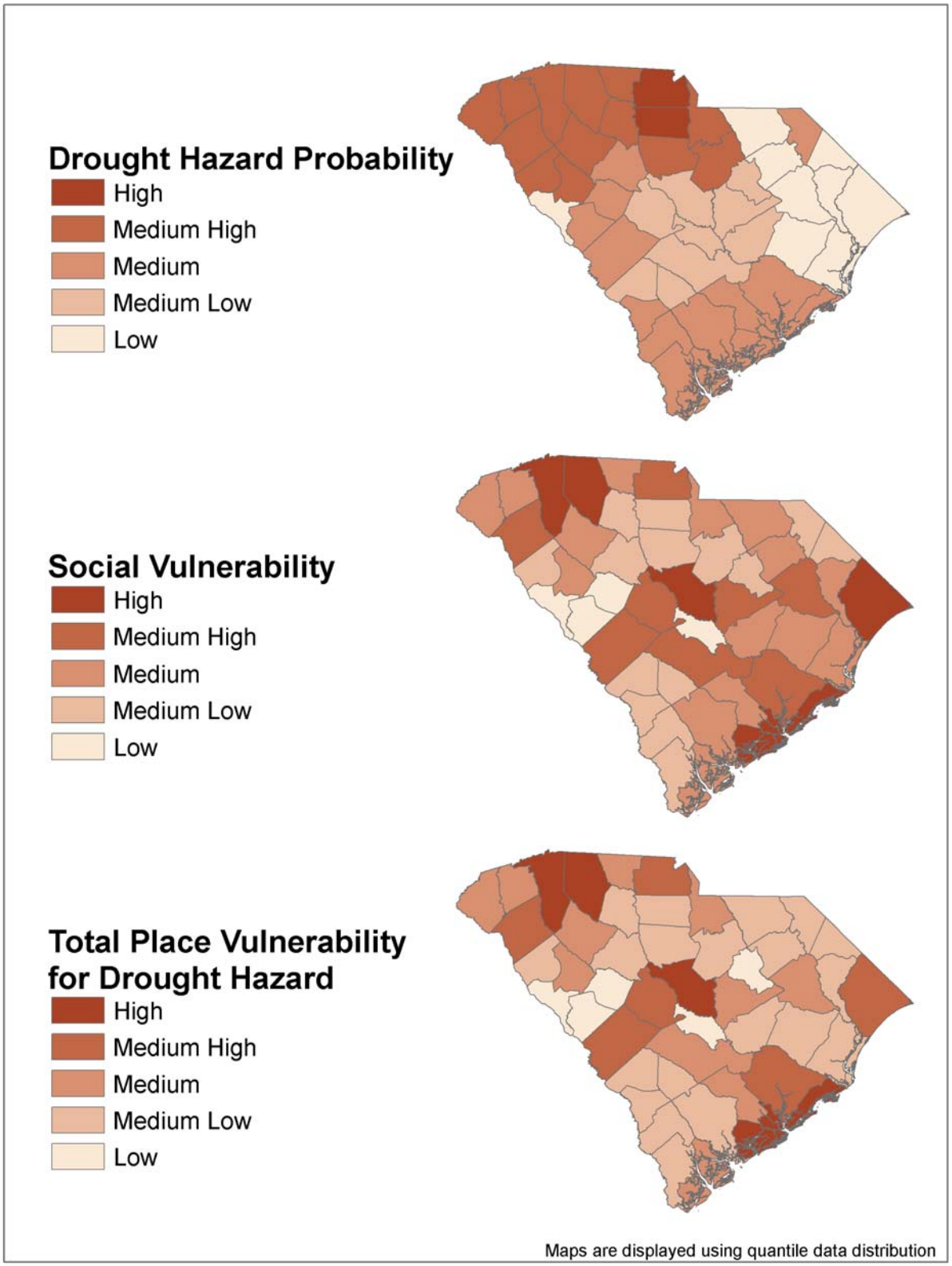


**Figure 5.16: Hazard Frequency of Occurrence, Social Vulnerability, and Place Vulnerability Scores for Drought Hazards**

## Table 5.9: Counties Ranked by Place Vulnerability for Drought

| Rank | County | Probability of Occurrence | Social Vulnerability Score | Place Vulnerability Score |
|---|---|---|---|---|
| 1 | GREENVILLE | 448.21 | 6.37 | 2855.13 |
| 2 | CHARLESTON | 408.93 | 5.59 | 2285.91 |
| 3 | SPARTANBURG | 444.64 | 4.80 | 2134.29 |
| 4 | RICHLAND | 344.64 | 5.52 | 1902.43 |
| 5 | ANDERSON | 442.86 | 3.41 | 1510.14 |
| 6 | HORRY | 308.93 | 4.52 | 1396.36 |
| 7 | YORK | 473.21 | 2.86 | 1353.39 |
| 8 | LEXINGTON | 344.64 | 3.86 | 1330.32 |
| 9 | AIKEN | 398.21 | 3.10 | 1234.46 |
| 10 | BERKELEY | 410.71 | 2.93 | 1203.39 |
| 11 | PICKENS | 448.21 | 2.25 | 1008.48 |
| 12 | ORANGEBURG | 344.64 | 2.81 | 968.45 |
| 13 | BEAUFORT | 410.71 | 2.31 | 948.75 |
| 14 | SUMTER | 344.64 | 2.71 | 933.98 |
| 15 | FLORENCE | 308.93 | 2.94 | 908.25 |
| 16 | LAURENS | 442.86 | 2.00 | 885.71 |
| 17 | OCONEE | 448.21 | 1.73 | 775.41 |
| 18 | DORCHESTER | 410.71 | 1.79 | 735.18 |
| 19 | GREENWOOD | 432.14 | 1.65 | 713.04 |
| 20 | LANCASTER | 439.29 | 1.61 | 707.25 |
| 21 | CHEROKEE | 444.64 | 1.58 | 702.54 |
| 22 | COLLETON | 410.71 | 1.64 | 673.57 |
| 23 | DARLINGTON | 308.93 | 2.06 | 636.39 |
| 24 | CHESTER | 473.21 | 1.29 | 610.45 |
| 25 | KERSHAW | 439.29 | 1.38 | 606.21 |
| 26 | MCCORMICK | 401.79 | 1.42 | 570.54 |
| 27 | WILLIAMSBURG | 308.93 | 1.80 | 556.07 |
| 28 | CLARENDON | 344.64 | 1.56 | 537.64 |
| 29 | UNION | 442.86 | 1.21 | 535.86 |
| 30 | FAIRFIELD | 439.29 | 1.20 | 527.14 |
| 31 | GEORGETOWN | 308.93 | 1.68 | 519.00 |
| 32 | ALLENDALE | 410.71 | 1.25 | 513.39 |
| 33 | NEWBERRY | 398.21 | 1.24 | 493.79 |
| 34 | HAMPTON | 410.71 | 1.20 | 492.86 |
| 35 | BAMBERG | 375.00 | 1.31 | 491.25 |
| 36 | MARLBORO | 308.93 | 1.58 | 488.11 |
| 37 | CHESTERFIELD | 303.57 | 1.58 | 479.64 |
| 38 | ABBEVILLE | 432.14 | 1.10 | 475.36 |
| 39 | DILLON | 308.93 | 1.48 | 457.21 |
| 40 | BARNWELL | 375.00 | 1.21 | 453.75 |
| 41 | JASPER | 410.71 | 1.08 | 443.57 |
| 42 | LEE | 344.64 | 1.19 | 410.13 |
| 43 | EDGEFIELD | 398.21 | 0.92 | 366.36 |
| 44 | SALUDA | 398.21 | 0.86 | 342.46 |
| 45 | CALHOUN | 344.64 | 0.88 | 303.29 |
| 46 | MARION | 305.36 | 0.78 | 238.18 |

# 6 CONCLUSION

Although this assessment was limited by the available data, it offers a broad representation of the hazards affecting South Carolina and the vulnerabilities we face. Specifically, this assessment concluded that there are nine counties that fall into the highest category of Total Place Vulnerability. Four of these counties (Lexington, Berkeley, Charleston, and Horry) have significantly higher scores, indicating significant population exposure to the impacts from multiple hazard categories. While all counties should have strong mitigation plans as well as effective response and recovery plans, Charleston, Berkeley, Horry, and Lexington show the greatest need for such planning efforts based on the demographics of their residents and prior hazard history.

This assessment serves as a foundation upon which to build further research on hazard impacts on South Carolina. Specifically, it provides a baseline overview of counties relative to one another. The next step is to have counties examine the impacts of hazards at a more localized level.

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**APPENDIX A**

## County Hazard Profiles

**Table A1: Abbeville County Hazard Profile**

| Hazard | Number of Events | Years in Record | Recurrence Interval (Years) | Hazard Frequency % Chance per year |
|---|---|---|---|---|
| **Hurricane/Tropical Storm** | 6 | 155 | 25.83 | 3.87 |
| **Tornado** | 14 | 56 | 4.00 | 25.00 |
| **Flood** | 21 | 31 | 1.48 | 67.74 |
| **Nuclear Power Plants** | * | * | * | * |
| **Earthquake** | 12 | 308 | 25.67 | 3.90 |
| **Fire - wildfire hazard only** | 889 | 17 | 0.02 | 5229.41 |
| **Hazardous materials (Hazmat)-- fixed facility and transportation** | 19 | 19 | 1.00 | 100.00 |
| **Terrorism** | * | * | * | * |
| **Transportation - motor vehicle** | 2104 | 6 | 0.0029 | 35066.67 |
| **Civil Disorder** | * | * | * | * |
| **Dam Failure** | * | * | * | * |
| **Severe Winter Storm** | 26 | 56 | 2.15 | 46.43 |
| **Drought** | 242 | 56 | 0.23 | 432.14 |

**Table A2: Aiken County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 11 | 155 | 14.09 | 7.10 |
| Tornado | 20 | 56 | 2.80 | 35.71 |
| Flood | 20 | 31 | 1.55 | 64.52 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 5 | 308 | 61.60 | 1.62 |
| Fire - wildfire hazard only | 2874 | 17 | 0.01 | 16905.88 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 165 | 19 | 0.12 | 868.42 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 19049 | 6 | 0.0003 | 317483.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 4 | 56 | 14.00 | 7.14 |
| Drought | 223 | 56 | 0.25 | 398.21 |

**Table A3: Allendale County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 17 | 155 | 9.12 | 10.97 |
| Tornado | 11 | 56 | 5.09 | 19.64 |
| Flood | 15 | 31 | 2.07 | 48.39 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 2 | 308 | 154.00 | 0.65 |
| Fire - wildfire hazard only | 544 | 17 | 0.03 | 3200.00 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 29 | 19 | 0.66 | 152.63 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 865 | 6 | 0.0069 | 14416.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 4 | 56 | 14.00 | 7.14 |
| Drought | 230 | 56 | 0.24 | 410.71 |

**Table A4: Anderson County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 6 | 155 | 25.83 | 3.87 |
| Tornado | 25 | 56 | 2.24 | 44.64 |
| Flood | 43 | 31 | 0.72 | 138.71 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 46 | 308 | 6.70 | 14.94 |
| Fire - wildfire hazard only | 795 | 17 | 0.02 | 4676.47 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 160 | 19 | 0.12 | 842.11 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 24189 | 6 | 0.0002 | 403150.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 42 | 56 | 1.33 | 75.00 |
| Drought | 248 | 56 | 0.23 | 442.86 |

**Table A5: Bamberg County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 19 | 155 | 8.16 | 12.26 |
| Tornado | 7 | 56 | 8.00 | 12.50 |
| Flood | 16 | 31 | 1.94 | 51.61 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 3 | 308 | 102.67 | 0.97 |
| Fire - wildfire hazard only | 868 | 17 | 0.02 | 5105.88 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 27 | 19 | 0.70 | 142.11 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 1469 | 6 | 0.0041 | 24483.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 4 | 56 | 14.00 | 7.14 |
| Drought | 210 | 56 | 0.27 | 375.00 |

**Table A6: Barnwell County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 12 | 155 | 12.92 | 7.74 |
| Tornado | 17 | 56 | 3.29 | 30.36 |
| Flood | 13 | 31 | 2.38 | 41.94 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 6 | 308 | 51.33 | 1.95 |
| Fire - wildfire hazard only | 856 | 17 | 0.02 | 5035.29 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 41 | 19 | 0.46 | 215.79 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 2048 | 6 | 0.0029 | 34133.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 4 | 56 | 14.00 | 7.14 |
| Drought | 210 | 56 | 0.27 | 375.00 |

**Table A7: Beaufort County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 25 | 155 | 6.20 | 16.13 |
| Tornado | 13 | 56 | 4.31 | 23.21 |
| Flood | 43 | 31 | 0.72 | 138.71 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 1 | 308 | 308.00 | 0.32 |
| Fire - wildfire hazard only | 1357 | 17 | 0.01 | 7982.35 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 364 | 19 | 0.05 | 1915.79 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 17603 | 6 | 0.0003 | 293383.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 2 | 56 | 28.00 | 3.57 |
| Drought | 230 | 56 | 0.24 | 410.71 |

**Table A8: Berkeley County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 26 | 155 | 5.96 | 16.77 |
| Tornado | 18 | 56 | 3.11 | 32.14 |
| Flood | 42 | 31 | 0.74 | 135.48 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 539 | 308 | 0.57 | 175.00 |
| Fire - wildfire hazard only | 5422 | 17 | 0.00 | 31894.12 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 388 | 19 | 0.05 | 2042.11 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 17093 | 6 | 0.0004 | 284883.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 5 | 56 | 11.20 | 8.93 |
| Drought | 230 | 56 | 0.24 | 410.71 |

**Table A9: Calhoun County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 20 | 155 | 7.75 | 12.90 |
| Tornado | 8 | 56 | 7.00 | 14.29 |
| Flood | 16 | 31 | 1.94 | 51.61 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 2 | 308 | 154.00 | 0.65 |
| Fire - wildfire hazard only | 782 | 17 | 0.02 | 4600.00 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 70 | 19 | 0.27 | 368.42 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 2164 | 6 | 0.0028 | 36066.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 5 | 56 | 11.20 | 8.93 |
| Drought | 193 | 56 | 0.29 | 344.64 |

**Table A10: Charleston County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 25 | 155 | 6.20 | 16.13 |
| Tornado | 19 | 56 | 2.95 | 33.93 |
| Flood | 73 | 31 | 0.42 | 235.48 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 34 | 308 | 9.06 | 11.04 |
| Fire - wildfire hazard only | 1857 | 17 | 0.01 | 10923.53 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 2309 | 19 | 0.01 | 12152.63 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 69396 | 6 | 0.0001 | 1156600.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 5 | 56 | 11.20 | 8.93 |
| Drought | 229 | 56 | 0.24 | 408.93 |

**Table A11: Cherokee County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 7 | 155 | 22.14 | 4.52 |
| Tornado | 9 | 56 | 6.22 | 16.07 |
| Flood | 31 | 31 | 1.00 | 100.00 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 1011 | 17 | 0.02 | 5947.06 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 143 | 19 | 0.13 | 752.63 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 8689 | 6 | 0.0007 | 144816.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 48 | 56 | 1.17 | 85.71 |
| Drought | 249 | 56 | 0.22 | 444.64 |

**Table A12: Chester County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 11 | 155 | 14.09 | 7.10 |
| Tornado | 8 | 56 | 7.00 | 14.29 |
| Flood | 22 | 31 | 1.41 | 70.97 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 7 | 308 | 44.00 | 2.27 |
| Fire - wildfire hazard only | 768 | 17 | 0.02 | 4517.65 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 88 | 19 | 0.22 | 463.16 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 4550 | 6 | 0.0013 | 75833.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 33 | 56 | 1.70 | 58.93 |
| Drought | 265 | 56 | 0.21 | 473.21 |

**Table A13: Chesterfield County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 20 | 155 | 7.75 | 12.90 |
| Tornado | 17 | 56 | 3.29 | 30.36 |
| Flood | 18 | 31 | 1.72 | 58.06 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 2 | 308 | 154.00 | 0.65 |
| Fire - wildfire hazard only | 2274 | 17 | 0.01 | 13376.47 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 43 | 19 | 0.44 | 226.32 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 4625 | 6 | 0.0013 | 77083.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 12 | 56 | 4.67 | 21.43 |
| Drought | 170 | 56 | 0.33 | 303.57 |

**Table A14: Clarendon County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 23 | 155 | 6.74 | 14.84 |
| Tornado | 17 | 56 | 3.29 | 30.36 |
| Flood | 16 | 31 | 1.94 | 51.61 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 1 | 308 | 308.00 | 0.32 |
| Fire - wildfire hazard only | 3124 | 17 | 0.01 | 18376.47 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 29 | 19 | 0.66 | 152.63 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 4141 | 6 | 0.0014 | 69016.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 5 | 56 | 11.20 | 8.93 |
| Drought | 193 | 56 | 0.29 | 344.64 |

**Table A15: Colleton County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 29 | 155 | 5.34 | 18.71 |
| Tornado | 11 | 56 | 5.09 | 19.64 |
| Flood | 28 | 31 | 1.11 | 90.32 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 2 | 308 | 154.00 | 0.65 |
| Fire - wildfire hazard only | 3869 | 17 | 0.00 | 22758.82 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 82 | 19 | 0.23 | 431.58 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 6101 | 6 | 0.0010 | 101683.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 0 | 56 | 15.47 | 0.00 |
| Drought | 230 | 56 | 0.24 | 410.71 |

**Table A16: Darlington County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 15 | 155 | 10.33 | 9.68 |
| Tornado | 19 | 56 | 2.95 | 33.93 |
| Flood | 12 | 31 | 2.58 | 38.71 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 2041 | 17 | 0.01 | 12005.88 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 97 | 19 | 0.20 | 510.53 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 8928 | 6 | 0.0007 | 148800.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 12 | 56 | 4.67 | 21.43 |
| Drought | 173 | 56 | 0.32 | 308.93 |

**Table A17: Dillon County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 12 | 155 | 12.92 | 7.74 |
| Tornado | 12 | 56 | 4.67 | 21.43 |
| Flood | 13 | 31 | 2.38 | 41.94 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 1150 | 17 | 0.01 | 6764.71 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 46 | 19 | 0.41 | 242.11 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 5664 | 6 | 0.0011 | 94400.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 11 | 56 | 5.09 | 19.64 |
| Drought | 173 | 56 | 0.32 | 308.93 |

**Table A18: Dorchester County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 24 | 155 | 6.46 | 15.48 |
| Tornado | 15 | 56 | 3.73 | 26.79 |
| Flood | 24 | 31 | 1.29 | 77.42 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 191 | 308 | 1.61 | 62.01 |
| Fire - wildfire hazard only | 2241 | 17 | 0.01 | 13182.35 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 155 | 19 | 0.12 | 815.79 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 13283 | 6 | 0.0005 | 221383.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 5 | 56 | 11.20 | 8.93 |
| Drought | 230 | 56 | 0.24 | 410.71 |

**Table A19: Edgefield County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 6 | 155 | 25.83 | 3.87 |
| Tornado | 8 | 56 | 7.00 | 14.29 |
| Flood | 9 | 31 | 3.44 | 29.03 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 3 | 308 | 102.67 | 0.97 |
| Fire - wildfire hazard only | 589 | 17 | 0.03 | 3464.71 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 36 | 19 | 0.53 | 189.47 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 2455 | 6 | 0.0024 | 40916.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 4 | 56 | 14.00 | 7.14 |
| Drought | 223 | 56 | 0.25 | 398.21 |

**Table A20: Fairfield County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 13 | 155 | 11.92 | 8.39 |
| Tornado | 13 | 56 | 4.31 | 23.21 |
| Flood | 12 | 31 | 2.58 | 38.71 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 555 | 308 | 0.55 | 180.19 |
| Fire - wildfire hazard only | 1102 | 17 | 0.02 | 6482.35 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 68 | 19 | 0.28 | 357.89 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 3168 | 6 | 0.0019 | 52800.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 10 | 56 | 5.60 | 17.86 |
| Drought | 246 | 56 | 0.23 | 439.29 |

**Table A21: Florence County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 17 | 155 | 9.12 | 10.97 |
| Tornado | 27 | 56 | 2.07 | 48.21 |
| Flood | 30 | 31 | 1.03 | 96.77 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 1 | 308 | 308.00 | 0.32 |
| Fire - wildfire hazard only | 3542 | 17 | 0.00 | 20835.29 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 160 | 19 | 0.12 | 842.11 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 24425 | 6 | 0.0002 | 407083.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 9 | 56 | 6.22 | 16.07 |
| Drought | 173 | 56 | 0.32 | 308.93 |

**Table A22: Georgetown County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 21 | 155 | 7.38 | 13.55 |
| Tornado | 10 | 56 | 5.60 | 17.86 |
| Flood | 53 | 31 | 0.58 | 170.97 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 2 | 308 | 154.00 | 0.65 |
| Fire - wildfire hazard only | 2143 | 17 | 0.01 | 12605.88 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 298 | 19 | 0.06 | 1568.42 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 7523 | 6 | 0.0008 | 125383.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 4 | 56 | 14.00 | 7.14 |
| Drought | 173 | 56 | 0.32 | 308.93 |

**Table A23: Greenville County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 10 | 155 | 15.50 | 6.45 |
| Tornado | 18 | 56 | 3.11 | 32.14 |
| Flood | 110 | 31 | 0.28 | 354.84 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 7 | 308 | 44.00 | 2.27 |
| Fire - wildfire hazard only | 848 | 17 | 0.02 | 4988.24 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 439 | 19 | 0.04 | 2310.53 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 65277 | 6 | 0.0001 | 1087950.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 55 | 56 | 1.02 | 98.21 |
| Drought | 251 | 56 | 0.22 | 448.21 |

**Table A24: Greenwood County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 9 | 155 | 17.22 | 5.81 |
| Tornado | 10 | 56 | 5.60 | 17.86 |
| Flood | 35 | 31 | 0.89 | 112.90 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 3 | 308 | 102.67 | 0.97 |
| Fire - wildfire hazard only | 1263 | 17 | 0.01 | 7429.41 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 98 | 19 | 0.19 | 515.79 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 9774 | 6 | 0.0006 | 162900.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 23 | 56 | 2.43 | 41.07 |
| Drought | 242 | 56 | 0.23 | 432.14 |

**Table A25: Hampton County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 19 | 155 | 8.16 | 12.26 |
| Tornado | 13 | 56 | 4.31 | 23.21 |
| Flood | 13 | 31 | 2.38 | 41.94 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 1541 | 17 | 0.01 | 9064.71 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 37 | 19 | 0.51 | 194.74 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 2098 | 6 | 0.0029 | 34966.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 3 | 56 | 18.67 | 5.36 |
| Drought | 230 | 56 | 0.24 | 410.71 |

**Table A26: Horry County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 21 | 155 | 7.38 | 13.55 |
| Tornado | 33 | 56 | 1.70 | 58.93 |
| Flood | 72 | 31 | 0.43 | 232.26 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 3118 | 17 | 0.01 | 18341.18 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 345 | 19 | 0.06 | 1815.79 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 45634 | 6 | 0.0001 | 760566.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 6 | 56 | 9.33 | 10.71 |
| Drought | 173 | 56 | 0.32 | 308.93 |

**Table A27: Jasper County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 27 | 155 | 5.74 | 17.42 |
| Tornado | 8 | 56 | 7.00 | 14.29 |
| Flood | 24 | 31 | 1.29 | 77.42 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 2932 | 17 | 0.01 | 17247.06 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 49 | 19 | 0.39 | 257.89 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 5060 | 6 | 0.0012 | 84333.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 2 | 56 | 28.00 | 3.57 |
| Drought | 230 | 56 | 0.24 | 410.71 |

**Table A28: Kershaw County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 12 | 155 | 12.92 | 7.74 |
| Tornado | 15 | 56 | 3.73 | 26.79 |
| Flood | 19 | 31 | 1.63 | 61.29 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 3 | 308 | 102.67 | 0.97 |
| Fire - wildfire hazard only | 1904 | 17 | 0.01 | 11200.00 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 123 | 19 | 0.15 | 647.37 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 6981 | 6 | 0.0009 | 116350.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 11 | 56 | 5.09 | 19.64 |
| Drought | 246 | 56 | 0.23 | 439.29 |

**Table A29: Lancaster County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 13 | 155 | 11.92 | 8.39 |
| Tornado | 9 | 56 | 6.22 | 16.07 |
| Flood | 18 | 31 | 1.72 | 58.06 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 782 | 17 | 0.02 | 4600.00 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 36 | 19 | 0.53 | 189.47 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 8312 | 6 | 0.0007 | 138533.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 12 | 56 | 4.67 | 21.43 |
| Drought | 246 | 56 | 0.23 | 439.29 |

**Table A30: Laurens County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 11 | 155 | 14.09 | 7.10 |
| Tornado | 9 | 56 | 6.22 | 16.07 |
| Flood | 32 | 31 | 0.97 | 103.23 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 6 | 308 | 51.33 | 1.95 |
| Fire - wildfire hazard only | 928 | 17 | 0.02 | 5458.82 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 79 | 19 | 0.24 | 415.79 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 9451 | 6 | 0.0006 | 157516.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 28 | 56 | 2.00 | 50.00 |
| Drought | 248 | 56 | 0.23 | 442.86 |

**Table A31: Lee County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 15 | 155 | 10.33 | 9.68 |
| Tornado | 8 | 56 | 7.00 | 14.29 |
| Flood | 11 | 31 | 2.82 | 35.48 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 1 | 308 | 308.00 | 0.32 |
| Fire - wildfire hazard only | 1428 | 17 | 0.01 | 8400.00 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 56 | 19 | 0.34 | 294.74 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 2216 | 6 | 0.0027 | 36933.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 6 | 56 | 9.33 | 10.71 |
| Drought | 193 | 56 | 0.29 | 344.64 |

**Table A32: Lexington County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 15 | 155 | 10.33 | 9.68 |
| Tornado | 14 | 56 | 4.00 | 25.00 |
| Flood | 26 | 31 | 1.19 | 83.87 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 6 | 308 | 51.33 | 1.95 |
| Fire - wildfire hazard only | 3969 | 17 | 0.00 | 23347.06 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 244 | 19 | 0.08 | 1284.21 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 33696 | 6 | 0.0002 | 561600.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 6 | 56 | 9.33 | 10.71 |
| Drought | 193 | 56 | 0.29 | 344.64 |

**Table A33: Marion County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 10 | 155 | 15.50 | 6.45 |
| Tornado | 8 | 56 | 7.00 | 14.29 |
| Flood | 14 | 31 | 2.21 | 45.16 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 9 | 308 | 34.22 | 2.92 |
| Fire - wildfire hazard only | 805 | 17 | 0.02 | 4735.29 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 23 | 19 | 0.83 | 121.05 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 4644 | 6 | 0.0013 | 77400.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 7 | 56 | 8.00 | 12.50 |
| Drought | 171 | 56 | 0.33 | 305.36 |

**Table A34: Marlboro County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 18 | 155 | 8.61 | 11.61 |
| Tornado | 12 | 56 | 4.67 | 21.43 |
| Flood | 15 | 31 | 2.07 | 48.39 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 1349 | 17 | 0.01 | 7935.29 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 23 | 19 | 0.83 | 121.05 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 3664 | 6 | 0.0016 | 61066.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 15 | 56 | 3.73 | 26.79 |
| Drought | 173 | 56 | 0.32 | 308.93 |

**Table A35: McCormick County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 20 | 155 | 7.75 | 12.90 |
| Tornado | 13 | 56 | 4.31 | 23.21 |
| Flood | 14 | 31 | 2.21 | 45.16 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 630 | 17 | 0.03 | 3705.88 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 41 | 19 | 0.46 | 215.79 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 995 | 6 | 0.0060 | 16583.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 7 | 56 | 8.00 | 12.50 |
| Drought | 225 | 56 | 0.25 | 401.79 |

**Table A36: Newberry County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 11 | 155 | 14.09 | 7.10 |
| Tornado | 22 | 56 | 2.55 | 39.29 |
| Flood | 15 | 31 | 2.07 | 48.39 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 21 | 308 | 14.67 | 6.82 |
| Fire - wildfire hazard only | 702 | 17 | 0.02 | 4129.41 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 51 | 19 | 0.37 | 268.42 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 5184 | 6 | 0.0012 | 86400.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 10 | 56 | 5.60 | 17.86 |
| Drought | 223 | 56 | 0.25 | 398.21 |

**Table A37: Oconee County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 7 | 155 | 22.14 | 4.52 |
| Tornado | 20 | 56 | 2.80 | 35.71 |
| Flood | 36 | 31 | 0.86 | 116.13 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 13 | 308 | 23.69 | 4.22 |
| Fire - wildfire hazard only | 673 | 17 | 0.03 | 3958.82 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 166 | 19 | 0.11 | 873.68 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 7907 | 6 | 0.0008 | 131783.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 57 | 56 | 0.98 | 101.79 |
| Drought | 251 | 56 | 0.22 | 448.21 |

**Table A38: Orangeburg County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 38 | 155 | 4.08 | 24.52 |
| Tornado | 38 | 56 | 1.47 | 67.86 |
| Flood | 23 | 31 | 1.35 | 74.19 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 20 | 308 | 15.40 | 6.49 |
| Fire - wildfire hazard only | 3965 | 17 | 0.00 | 23323.53 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 360 | 19 | 0.05 | 1894.74 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 14311 | 6 | 0.0004 | 238516.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 5 | 56 | 11.20 | 8.93 |
| Drought | 193 | 56 | 0.29 | 344.64 |

**Table A39: Pickens County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 7 | 155 | 22.14 | 4.52 |
| Tornado | 16 | 56 | 3.50 | 28.57 |
| Flood | 53 | 31 | 0.58 | 170.97 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 5 | 308 | 61.60 | 1.62 |
| Fire - wildfire hazard only | 941 | 17 | 0.02 | 5535.29 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 122 | 19 | 0.16 | 642.11 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 12029 | 6 | 0.0005 | 200483.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 51 | 56 | 1.10 | 91.07 |
| Drought | 251 | 56 | 0.22 | 448.21 |

**Table A40: Richland County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 25 | 155 | 6.20 | 16.13 |
| Tornado | 25 | 56 | 2.24 | 44.64 |
| Flood | 36 | 31 | 0.86 | 116.13 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 16 | 308 | 19.25 | 5.19 |
| Fire - wildfire hazard only | 1474 | 17 | 0.01 | 8670.59 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 216 | 19 | 0.09 | 1136.84 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 60947 | 6 | 0.0001 | 1015783.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 6 | 56 | 9.33 | 10.71 |
| Drought | 193 | 56 | 0.29 | 344.64 |

**Table A41: Saluda County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 6 | 155 | 25.83 | 3.87 |
| Tornado | 8 | 56 | 7.00 | 14.29 |
| Flood | 11 | 31 | 2.82 | 35.48 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 2 | 308 | 154.00 | 0.65 |
| Fire - wildfire hazard only | 631 | 17 | 0.03 | 3711.76 |
| Hazardous materials (Hazmat)--fixed facility and transportation | 80 | 19 | 0.24 | 421.05 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 2062 | 6 | 0.0029 | 34366.67 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 6 | 56 | 9.33 | 10.71 |
| Drought | 223 | 56 | 0.25 | 398.21 |

**Table A42: Spartanburg County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 10 | 155 | 15.50 | 6.45 |
| Tornado | 26 | 56 | 2.15 | 46.43 |
| Flood | 88 | 31 | 0.35 | 283.87 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 4 | 308 | 77.00 | 1.30 |
| Fire - wildfire hazard only | 890 | 17 | 0.02 | 5235.29 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 419 | 19 | 0.05 | 2205.26 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 39393 | 6 | 0.0002 | 656550.00 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 55 | 56 | 1.02 | 98.21 |
| Drought | 249 | 56 | 0.22 | 444.64 |

**Table A43: Sumter County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 22 | 155 | 7.05 | 14.19 |
| Tornado | 13 | 56 | 4.31 | 23.21 |
| Flood | 15 | 31 | 2.07 | 48.39 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 1 | 308 | 308.00 | 0.32 |
| Fire - wildfire hazard only | 2310 | 17 | 0.01 | 13588.24 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 135 | 19 | 0.14 | 710.53 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 14219 | 6 | 0.0004 | 236983.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 6 | 56 | 9.33 | 10.71 |
| Drought | 193 | 56 | 0.29 | 344.64 |

**Table A44: Union County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 11 | 155 | 14.09 | 7.10 |
| Tornado | 13 | 56 | 4.31 | 23.21 |
| Flood | 36 | 31 | 0.86 | 116.13 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 3 | 308 | 102.67 | 0.97 |
| Fire - wildfire hazard only | 674 | 17 | 0.03 | 3964.71 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 30 | 19 | 0.63 | 157.89 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 3356 | 6 | 0.0018 | 55933.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 27 | 56 | 2.07 | 48.21 |
| Drought | 248 | 56 | 0.23 | 442.86 |

**Table A45: Williamsburg County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| Hurricane/Tropical Storm | 22 | 155 | 7.05 | 14.19 |
| Tornado | 8 | 56 | 7.00 | 14.29 |
| Flood | 15 | 31 | 2.07 | 48.39 |
| Nuclear Power Plants | * | * | * | * |
| Earthquake | 0 | 308 | 0.00 | 0.00 |
| Fire - wildfire hazard only | 5698 | 17 | 0.00 | 33517.65 |
| Hazardous materials (Hazmat)-- fixed facility and transportation | 29 | 19 | 0.66 | 152.63 |
| Terrorism | * | * | * | * |
| Transportation - motor vehicle | 4454 | 6 | 0.0013 | 74233.33 |
| Civil Disorder | * | * | * | * |
| Dam Failure | * | * | * | * |
| Severe Winter Storm | 6 | 56 | 9.33 | 10.71 |
| Drought | 173 | 56 | 0.32 | 308.93 |

**Table A46: York County Hazard Profile**

| Hazard | Number Of Events | Years In Record | Recurrence Interval (Years) | Hazard Frequency % Chance per Year |
|---|---|---|---|---|
| **Hurricane/Tropical Storm** | 11 | 155 | 14.09 | 7.10 |
| **Tornado** | 14 | 56 | 4.00 | 25.00 |
| **Flood** | 34 | 31 | 0.91 | 109.68 |
| **Nuclear Power Plants** | * | * | * | * |
| **Earthquake** | 1 | 308 | 308.00 | 0.32 |
| **Fire - wildfire hazard only** | 780 | 17 | 0.02 | 4588.24 |
| **Hazardous materials (Hazmat)-- fixed facility and transportation** | 330 | 19 | 0.06 | 1736.84 |
| **Terrorism** | * | * | * | * |
| **Transportation - motor vehicle** | 24851 | 6 | 0.0002 | 414183.33 |
| **Civil Disorder** | * | * | * | * |
| **Dam Failure** | * | * | * | * |
| **Severe Winter Storm** | 32 | 56 | 1.75 | 57.14 |
| **Drought** | 265 | 56 | 0.21 | 473.21 |